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Car-Roof Nomenclature

In every industry new names from time to time must be coined or adapted to distinguish new methods, devices or constructions. In the early days of electric railways the word "interurban" was fittingly applied to cross-country lines connecting different towns and cities, and many other terms might be mentioned which have found their way into the nomenclature of electric railway work. In car design some of the names which have been invented or adapted have been truly descriptive, while others have been colloquial and almost meaningless. In some cases several different names have been applied to the same part or type of construction. One of the most striking examples of this diversified nomenclature is the variety of names which have been applied to the type of car roof in which no monitor deck is used and the roof is formed in a smooth symmetrical curve from one side to the other. Some of the names which have been applied to this construction are "turtle-back roof," "segmental roof," "elliptical roof," "flat-arch roof" and "arch roof." All of these are intended to be synonymous and their indiscriminate use leads to unnecessary confusion. The name "arch roof" is more nearly descriptive and general in its application to different variations of design than any of the others, and this term has been used throughout in the new Electric Railway Dictionary. One of the objects in preparing the Electric Railway Dictionary was to bring about standardization of terms such as these, and carbuilders, master mechanics and others cannot do better than to follow the Dictionary as a guide.

Transfers in New York

In spite of the fact that the rapid transit question is by no means settled in New York City, the Public Service Commission, First District, has decided to begin an immediate investigation into the desirability of requiring the surface railways to adopt air brakes on all of their cars and has also begun a series of hearings at which the railway companies are requested to present reasons why a practically universal system of transfers should not be required on all the lines in Manhattan Borough. The first hearing on this subject was held July 6, and while the proposed order of the commission does not require the exchange of transfers at every junction point a sufficient number are mentioned so that most of the independent cross-town and longitudinal lines are concerned. It is somewhat difficult to know just what additional testimony on this subject is expected or desired. The topic was investigated by the commission very thoroughly about two years ago and the testimony elicited at those hearings was published in this paper. We know of no material developments since that time which would warrant the companies in looking upon the

issue of transfers between independent lines with any greater favor than they did at that time. But there has been agitation on the subject at Albany, and an official repetition of the facts which should be obvious may be needed for the education of the up-State legislators. If this is the case, the campaign of education should be thorough and those Assemblymen and Senators who stood sponsors for the bills and strongly advocated them should be required to be present in New York at all the hearings until the entire series is completed. This would be a punishment to fit the crime.

Problems of Midsummer

The extraordinary period of hot weather which has extended over the greater part of the eastern half of this country during the past two weeks has brought its problems to electric railway managers. While men engaged in other work have been able to flee to the seashore or mountains for relief, railway operation has had to go on with the added burdens of providing a service for those who have to get their fresh air and their recreation on the electric cars and with a force of employees enervated by the torrid heat. The verdict as to the cause of the terrible disaster on the New Haven railroad has not yet been rendered, but it is not at all unlikely that the engineer who appears to have caused the accident by having disobeyed or forgotten an order was rendered less alert in mind by the tropical period through which the country has been passing. Certainly it is not at all unusual for accidents on electric railways to increase during warm weather. This is partly due to the fact that the employees are less quick to realize opportunities for accidents and avoid them, and also because the public is in the same condition and is unable to take care of itself. At one time a continuance of the thermometer for a week or more among the nineties would have meant a large increase in number of motor burn-outs. This was when the factor of safety, or rather the character of construction and the overload capacity of railway motors, was lower than at present. Fortunately, improvements in insulation have reduced this trouble. A greater possible source of danger lies in overloaded and poorly ventilated generating and transforming apparatus and in transmission cables forced to carry greater loads than those for which they were intended. The heated season, however, is the time of greatest traffic to a great many companies. The three months or so of summer form the principal reason for their existence. On such roads the training of employees forms a special and very serious problem because, as a rule, the greater part of the force of both motormen and conductors have to be broken in just for this period. It is a satisfaction to know, however, that the ideas of both the public and the management as regards the proper dress for railroad employees are more sensible than formerly. At one time it would have been considered undignified, if that is the proper term to use, for motormen to discard their coats at any time. Now the men have that privilege even on Broadway, New York. Even the rule of increased traffic in hot weather has its exceptions, and several roads have reported that traffic has fallen off somewhat during the past two weeks because it has been "too hot to ride."

INTERURBAN COUPLER STANDARDIZATION

A standard coupler for interurban service is greatly needed by the interurban railways of the Central States and should be adopted by all roads operating large cars in trains of more than one unit. Briefly, the reasons which urge this course are safety, facility of interchange and economy. The need for greater facility of interchange is probably the most important factor now urging coupler standardization. All interurban roads, to a greater or less extent, handle steam cars over their lines and most of the roads at present use some form of shackle bar, even for pushing and pulling cars on straight track. Similarly, the network of interurban lines in Ohio and Indiana has seen such a rapid growth in its freight and passenger traffic during the last few years that interline service with trains of several cars has become necessary. Some electric roads regularly handle interline freight in connection with steam roads and so uniform coupling devices are required. A number of groups of roads now operate or are planning to operate trailers in interline service. The trail car, either passenger or freight, is drawn in turn over each separately owned portion of the route by being attached to a regular train. At junction points the trailer is uncoupled from the motor car of the delivering road and coupled to the motor car of the connecting line, which hauls it over another division of the route and in turn delivers it to destination or to another road for transportation to destination. Thus, through trail cars on these long routes are handled by the motor cars of several companies, and service can be operated with safety and facility only when all cars are equipped with uniform couplers. The groups of roads operating this through trailer service have, of course, equipped their cars with the same type of coupler, but the couplers used by one group of roads frequently will not satisfactorily intercouple with those used by another group, and so, when a variation in routing is required, some compromise coupling, such as a shackle bar, must be used.

Economy in first cost and in maintenance charges should also follow coupler standardization. At the present time a manufacturer must be prepared to supply a variety of types of couplers which, if reduced in number and manufactured in larger quantities, could be sold at a lower price. In like manner, the purchaser of couplers, when only a standard design is used, will need to carry in stock the minimum number of repair parts.

About a year ago, urged by the foregoing reasons, the Central Electric Railway Association's standardization committee held several meetings and recommended to the association fourteen requirements for a standard coupler. Later these requirements were approved by the association. Now the equipment committee of the Engineering Association, as reported in this issue, has concluded several conferences with coupler manufacturers and also a joint meeting with the Central Electric standardization committee, so that it has information available with which to formulate at least tentative requirements for a standard coupler. The equipment committee is not going so far in the recommendation of details as did the Central Electric Railway Association, the reasons no doubt being the newness of the problem and the desire on the part of the equipment committee to lay down

only such requirements as may now serve to point the roads and coupler manufacturers toward a uniform type that will meet present requirements and yet allow sufficient freedom for development.

The chief controlling requirements as finally considered by the committee at the Indianapolis meeting are worthy of special mention. The first was that couplers must couple by impact with all M.C.B. couplers used by steam roads. This means the use of the M.C.B. contour and vertical-plane type of coupler. The second, "couplers must have radial drawbars," is a necessary requirement on account of the long overhang of interurban cars and the sharp curves around which they must operate. These conditions call for comparatively long drawbars, which generally are pivoted so that a coupler may swing through an arc of 120 deg., or to the limits imposed by the car steps, which in some cases have to be cut away to provide for a maximum swing when 65-ft. cars are hauled around 33-ft. radius curves.

Another requirement, that the coupler must provide for successful operation over irregularities in grades met in interurban practice, is fair because it qualifies the design for the service to be performed. The committee also, after considerable discussion regarding the repair problem in interchange service, inserted a clause to the effect that couplers should have shanks of such dimensions that in an emergency an M.C.B. coupler might readily be substituted. This method of repairing couplers probably would be used very infrequently in the interchange service as now given, but the continued growth of interchange between steam and electric roads warranted the committee in making such a provision for the future. The limit of angularity between the axes of two couplers was put at 8 deg., so that slack would not unduly accumulate in long trains and the requirement was inserted that couplers must withstand the stresses occasioned by pushing cars around curves. Other requirements were that all couplers must permit uncoupling without requiring employees to go between cars and must have knuckles limited in height to between 11 in. and 16 in.

In part these recommendations of the committee for standard requirements which the Engineering Association should lay down for standard couplers are incomplete because they do not say whether coupler heads should or should not be rigidly locked together against vertical movement. The committee requires, however, that all makes of interurban couplers must couple and operate properly with each other. At the present time there is considerable controversy as to whether coupler heads should be held together rigidly, as with the center lock, or should be permitted to have vertical movement to the full height of the knuckle. Couplers designed according to each of these principles have found favor in the field, and, while each will meet all the other requirements, the two types of couplers will not operate properly with each other, although they will intercouple. The combination of a coupler with a center lock and one with a bracket-arm attachment for preventing lateral movement would operate satisfactorily so long as the coupler heads were under tension. But buckling will occur when cars are pushed around curves because the anti-buckling devices on the two couplers will not mate with each other and therefore will be inoperative.

Thus the committee has left leeway for the development and the acceptance by the roads of either the coupler with center locks or that without. Similarly the committee has not definitely stated whether standard couplers should provide for operation over irregularities in grade by the slipping of one knuckle inside of the other, as in M.C.B. practice, or by flexible carriers, as in the case of rigidly locked coupler heads. Both methods are satisfactorily followed in electric railway practice. The two foregoing indefinite points are very important, and until they are arbitrarily decided coupler standardization cannot proceed to the extent that is desired.

ECONOMY IN THE CARHOUSE

Although it is difficult to evaluate possible small improvements in the conduct of work in the carhouse, there are few places on the system where the introduction of labor-saving methods pay better. It is surprising how many tasks performed here are repeated in the course of a year. In the large repair shop a considerable quantity of new work is usually being carried forward with routine maintenance, but in the carhouse, which is frequently confined to the handling of lighter repairs, the greater part of the work done resembles what has been often performed before, and it is consequently susceptible to minor betterments to a multiplied degree.

Among the possible lines of attack on the problem of carhouse economy of operation is the matter of stock distribution. Experience tends to show that it is advisable to maintain, at least during the daytime, some degree of sub-storage outside the main stockroom. The practice of keeping a few brakeshoes at the pit where repairs are made and of carrying a few sizes of bolts in portable tool boxes saves time otherwise spent in trips to and from the stockroom, and this material can easily be checked as sent out. Although it is an old story, too much emphasis cannot be laid upon the importance of labeling all bins accurately in the stockroom and of providing enough bins to forestall any need of miscellaneous storage of supplies on the floor. Another improvement worth considering is the equipment of transfer tables with brakes, so that the sudden kick of the car as it is leaving the table for the permanent track will not result in a derailment. The proper tagging and requisitioning of material sent to the shop or main storehouse from the carhouse as a sample to be duplicated is a potent source of economy, since the failure to handle this particular task accurately and completely sometimes results in the receipt of spare parts which do not fit the equipment at the local house, with resulting delay in returning cars to service and increased costs of transporting supplies over the system. The wear of parts to the limit of reliability also deserves consideration. Controller fingers should be retained even when the tips need renewal, and the life of tips is almost always increased if they are reversed and thus have the opportunity to wear more evenly. With the multiplicity of parts in modern car equipment it is easy to make the wrong attachments at times, as in mixing relay studs in multiple-unit-control maintenance. Upon such small points may rest the integrity of high-powered motors when carrying their service loads.

Venice Power Station of Illinois Traction System

This Station Was Made Necessary by the Entrance of the Illinois Traction System into St. Louis. It Has Recently Been Completed and Possesses Many Interesting Features.

Before the completion of the large new St. Louis terminal facilities of the Illinois Traction System energy for the 100 miles of line south of Springfield was transmitted at 33,000 volts from the generating station near Springfield. The large increase in interurban freight and passenger traffic in and out of St. Louis, the addition of thirty street cars for service between St. Louis and the tri-cities—Alton, Granite City and Venice—and the recent acquisition of commercial power customers for the local lighting systems of this company made necessary the construction of a generating station at some point near St. Louis. Accordingly, as announced in earlier issues of this paper, plans were made about two years ago for the construction of the first half of a large, modern type station to be located in Venice near the east approach to the McKinley Bridge over the Mississippi River. This station was put into service on Oct. 1, 1910, and now handles the load of the local street car lines, the interurban passenger and freight lines and the lighting and commercial business of the Madison County Light & Power Company. Local current for railway operation is distributed at 650 volts. The interurban substations for the 100 miles of line are supplied over a 33,000-volt transmission line and the city feeders of the local lighting companies are supplied with 2300-volt, 60-cycle current from frequency converters in the large new station.

Some of the constructional features of the new Venice station which are of particular interest are the foundation work designed to meet a 40-ft. rise in the Mississippi River, the intake and discharge system designed to meet the same water conditions and built in quicksand, and the coal-handling facilities. The latter provide for the automatic handling by gravity of coal to the boilers and ashes from the boilers with the use only of standard steam railway cars. In addition, the electrical section of the new station has been designed with high regard for continuity of service and, as in the case of the steam equipment, an especially generous amount of room has been apportioned to each piece of apparatus. The present steam and electrical generating units have sufficient capacity to handle the existing load, but provision has been made in the design so that the largest generating units now available may be installed when the expected increase in load makes this a necessity. The accompanying illustrations from drawing and photographs show the controlling dimensions and appearance of the large new station.

BUILDING LOCATION

The site of the new Venice power station is about 3.5 miles from the business center of St. Louis. It is located close to the Illinois approach to the McKinley Bridge and about 800 ft. from the average shore line of the Mississippi River. The elevation of the double tracks on the bridge is 5 ft. higher than the elevation of the double tracks over the coal bunkers in the boiler house, and thus, by means of

a steel trestle, coal trains are shunted directly over the bunkers from the main-line tracks.

The soil conditions and the probability of a variation in water level of about 40 ft. required that particular attention be given to the foundations of the power-station structure and machinery. The Traction System owns sufficient property so that the size of the station can be doubled later.

FOUNDATION WORK

The ground dimensions of the completed portion of the new station are 138 ft. 6 in. x 192 ft. 3 in., and the structure from the level of the sub-basement floor to the top of the side walls is 92 ft. high. The two most important factors



Illinois Traction Power Station—View from Southwest

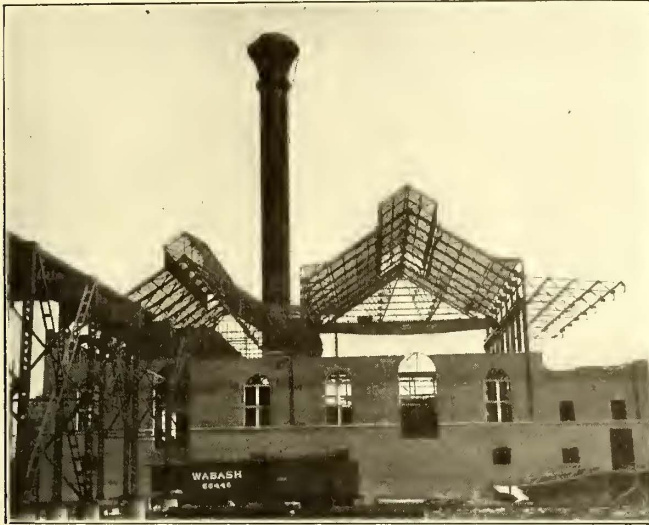
considered in the building of the foundations for the structure and the machinery were the underlying bed of quicksand on the shore of the river and the known water-level variation of 38 ft.

The height of the condenser and piping floor is at the high-water level, and the machinery floor is still 12 ft. 6 in. higher. The sub-basement floor is 17 ft. below high-water level and 21 ft. above low-water level. The basement and sub-basement form a concrete box whenever the water level reaches 21 ft. above the floor. The hydrostatic pressure tending to lift the sub-basement floor will be very great, and to have provided for the stresses would have required considerable reinforcing material in the heavy concrete work. If this sub-basement had been utilized for machinery the foundation work must also necessarily have been watertight. Therefore, it was decided to place below the high-water level none of the power-plant machinery except that which might be submerged. This would allow the sub-basement to be filled with water whenever the water level outside of the station became so high as to put the sub-basement floors and walls under stress. Thus no reinforcing was needed and it was not necessary to waterproof the large substructure. A section and plan of this intake appear on page 112.

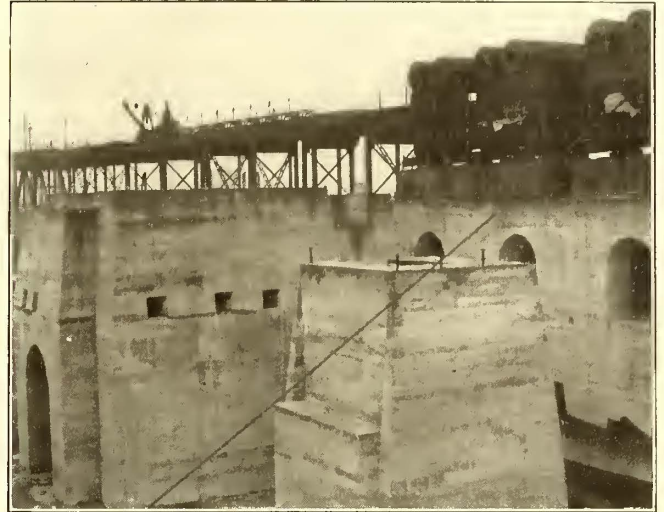
CONCRETE PILING

The concrete foundations of the power plant and its machinery rest upon 500 concrete piles having an average length of 22 ft. 2½ in. These piles were built in the ground according to the Raymond process. A sheet-steel

been necessary to cut off the piles at the floor level, while with the Raymond piles no concrete was placed above the desired elevation. The piling was grouped under the side walls and under the machinery foundations, according to the loads to be sustained. After the 500 piles had been



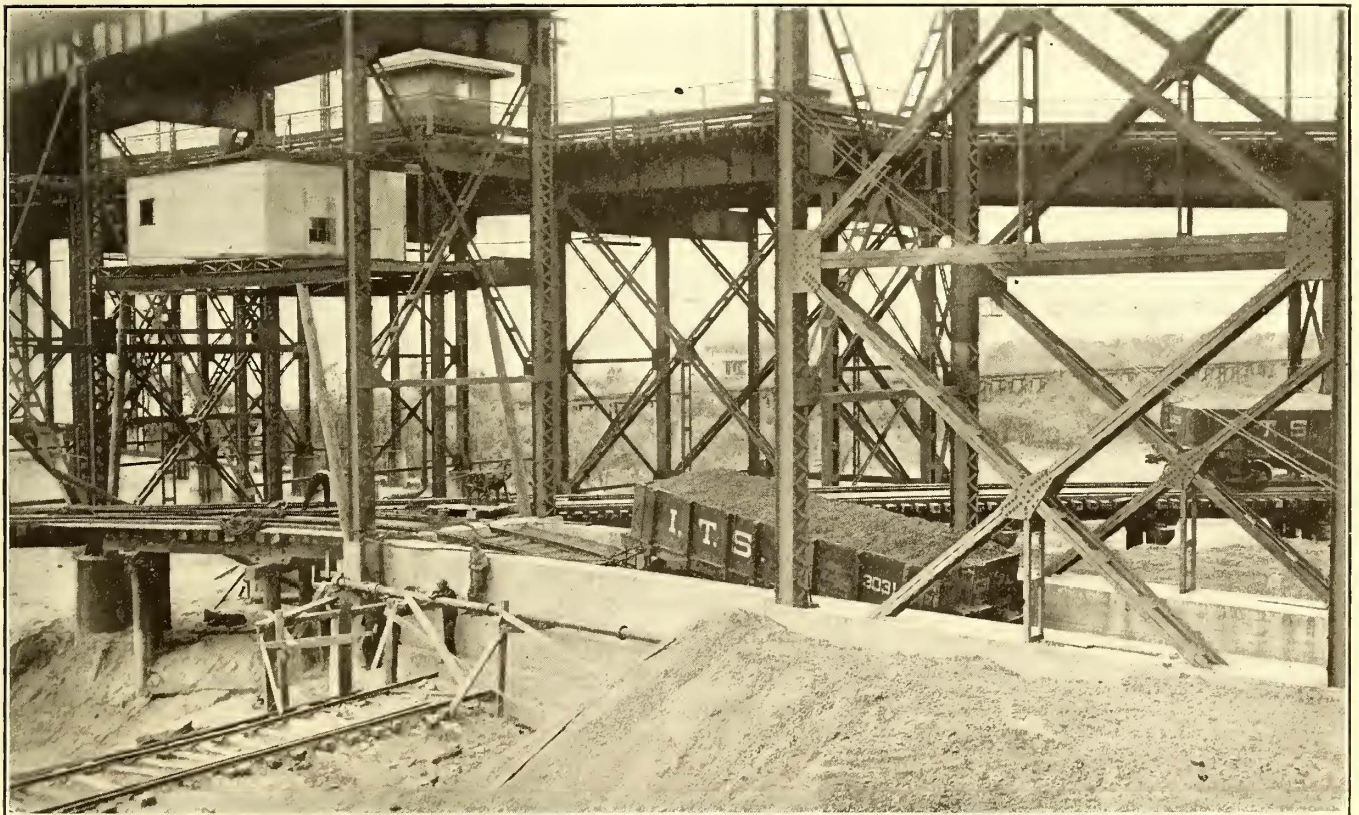
Illinois Traction Power Station—Steel Work During Erection



Illinois Traction Power Station—Foundations During Erection

metal core inclosed in a steel shell was driven in to sufficient penetration and then the core was withdrawn, leaving the steel casing in place. Concrete was then deposited in the casing up to the desired height. In general, the piles were 8 in. in diameter at the bottom and 18 in. in diameter

sunk their heads were covered with a sub-floor slab of concrete 3 ft. thick. This slab is approximately 200 ft. x 140 ft. in area, and ties the tops of all the piles together and also distributes the stresses imposed by the superstructure and its foundation walls. Approximately 9000 cu.



Illinois Traction Power Station—Ash Pit, Track and Coal Crusher

at the top. Those piles which were tested stood loads of 60 tons each. The engineers state that by the use of this method of pile-sinking considerable economy was effected over the use of ready-made concrete piles. With the latter type, after penetration had been reached, it would have

yd. of concrete were used in the substructure and foundations installed in this power station. About \$75,000 was spent for raising the elevation of the floors above water level. This expenditure would not have been necessary had it been possible to locate the plant on higher ground.

BUILDING SUPERSTRUCTURE

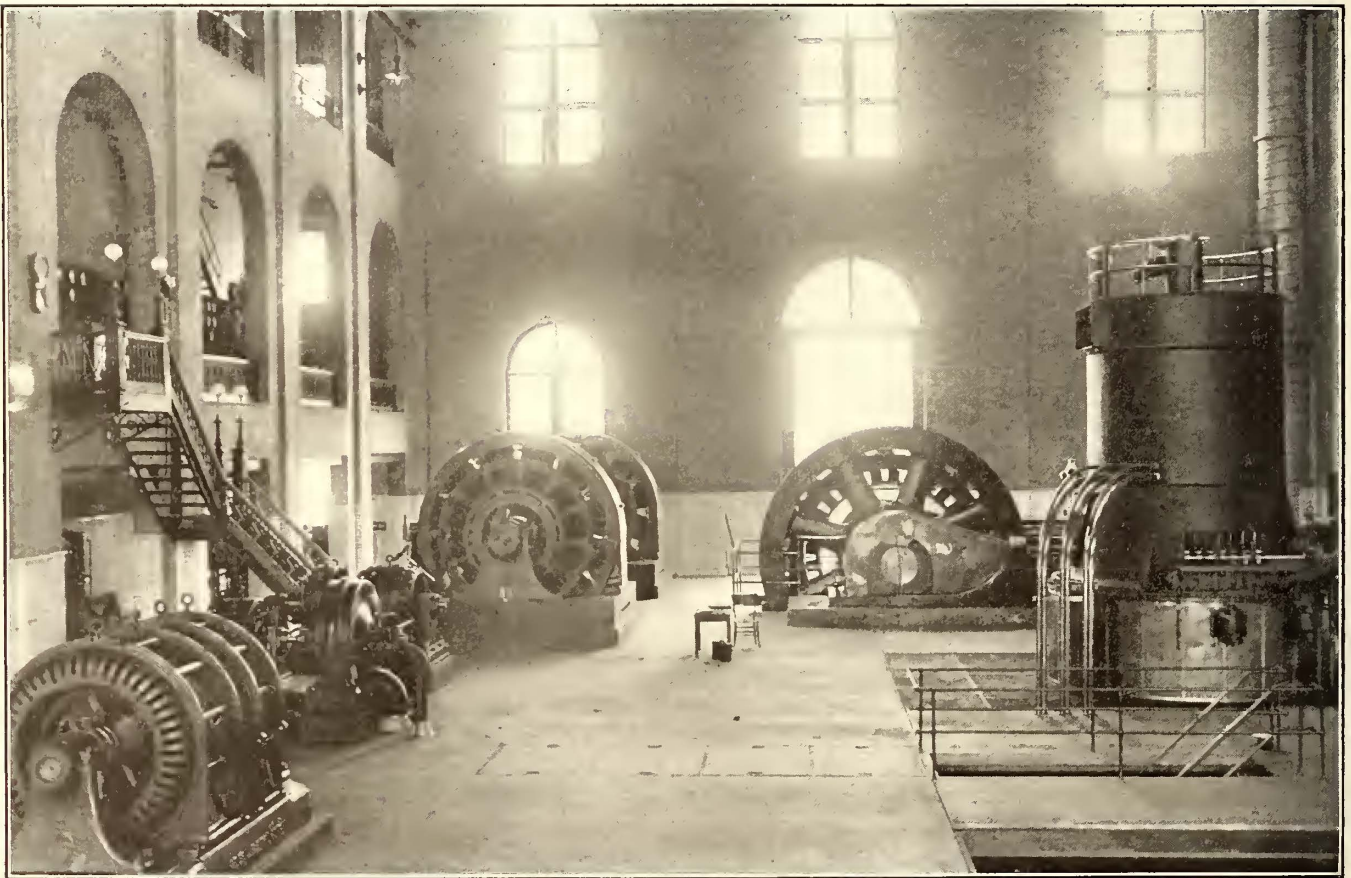
The superstructure of the building consists of three principal sections: a boiler house, 80 ft. wide, an engine room, 73 ft. wide, and a series of electrical galleries, 30 ft. wide. All three sections are 134 ft. long. The walls of the superstructure are of red brick, trimmed with white stone. The roofs are made of book tile covered with Cary roofing. The structural steel work weighed 750 tons and was installed by the McClintic-Marshall Company. The concrete substructure was placed by the Myers Construction Company, and the concrete and brick superstructure by the Fruin & Colnon Construction Company.

All partitions and floors are made of fireproof material. The floors are carried by the structural steel work, which in turn supports arched concrete slabs reinforced with Clinton wire cloth. The interior walls are laid with light-colored sand-lime brick and a white enamel-brick wainscot. Metal stairways are installed and have steps made of inverted channel iron filled with concrete treads. The chief engineer's office on the switchboard gallery is finished in

As will be noted from the plan, the boiler-house space provides for duplicating the boiler equipment and the stack. The stack into which the present boilers exhaust is of the self-supporting steel type and is 12 ft. in diameter and 200 ft. high. It has a brick lining extending to the top. The lining is not tied to the steel work because of the possibility of damage by reason of unequal expansion. A tapered sheet-steel smoke flue connects the furnaces with the stack. As the ultimate plant will include two stacks, each serving twelve boilers symmetrically placed on either side in groups of six, the layout of the smoke flue has been designed to take care of the future boiler installation. Only one opening into each stack will be made.

COAL-HANDLING FACILITIES

Fuel is received over the interurban line, and thus can be brought from either the nearby steam connections or from the mines owned and served by this company. The location of the new plant near the McKinley Bridge made feasible the very economical coal-handling arrangements which have been provided. Two standard-gage tracks connecting



Illinois Traction Power Station—Engine Room from East End

oak. Close to the office are the toilet facilities, which include shower baths and Merritt steel clothes lockers with expanded metal doors.

The engine room is served from end to end by a 30-ton Case crane with its runway placed 47 ft. 6 in. above the floor. This vertical clearance will permit the installation of large steam turbines or marine engines, according to the future requirements.

BOILER PLANT

The boiler plant, as so far required, includes six O'Brien water-tube boilers of 608 hp each. These are equipped with the Illinois Stoker Company's chain grates. Each boiler has a Foster internal superheater adding about 80 deg. superheat. The stokers are operated by a line shaft driven either by an electric motor or by a stoker engine and the draft of the stack is controlled by a Spencer damper regulator.

with the main-line tracks on the Illinois approach to the bridge are carried on a steel trestle which leads directly to the end of the boiler house and then over the full length of the coal bunkers. In this way an electric locomotive may handle a train of ten cars directly from the main line into the boiler house, where the coal may be dumped into a series of steel hopper-bottom bunkers having a storage capacity for 800 tons. Elevated track space is also provided for storing about 300 tons additional fuel.

The elevation of the bunkers in the boiler house is such that coal will flow by gravity directly to the chain-grate stokers. The ashes from the furnaces fall into concrete storage hoppers. Gates at the front of these hoppers permit the cinders to be dumped easily by gravity directly into a standard gondola car on a track extension into the sub-basement of the boiler house. Thus when the cinders have been placed in these cars they do not require to be rehan-

dled before they are shipped along the road for use as filling.

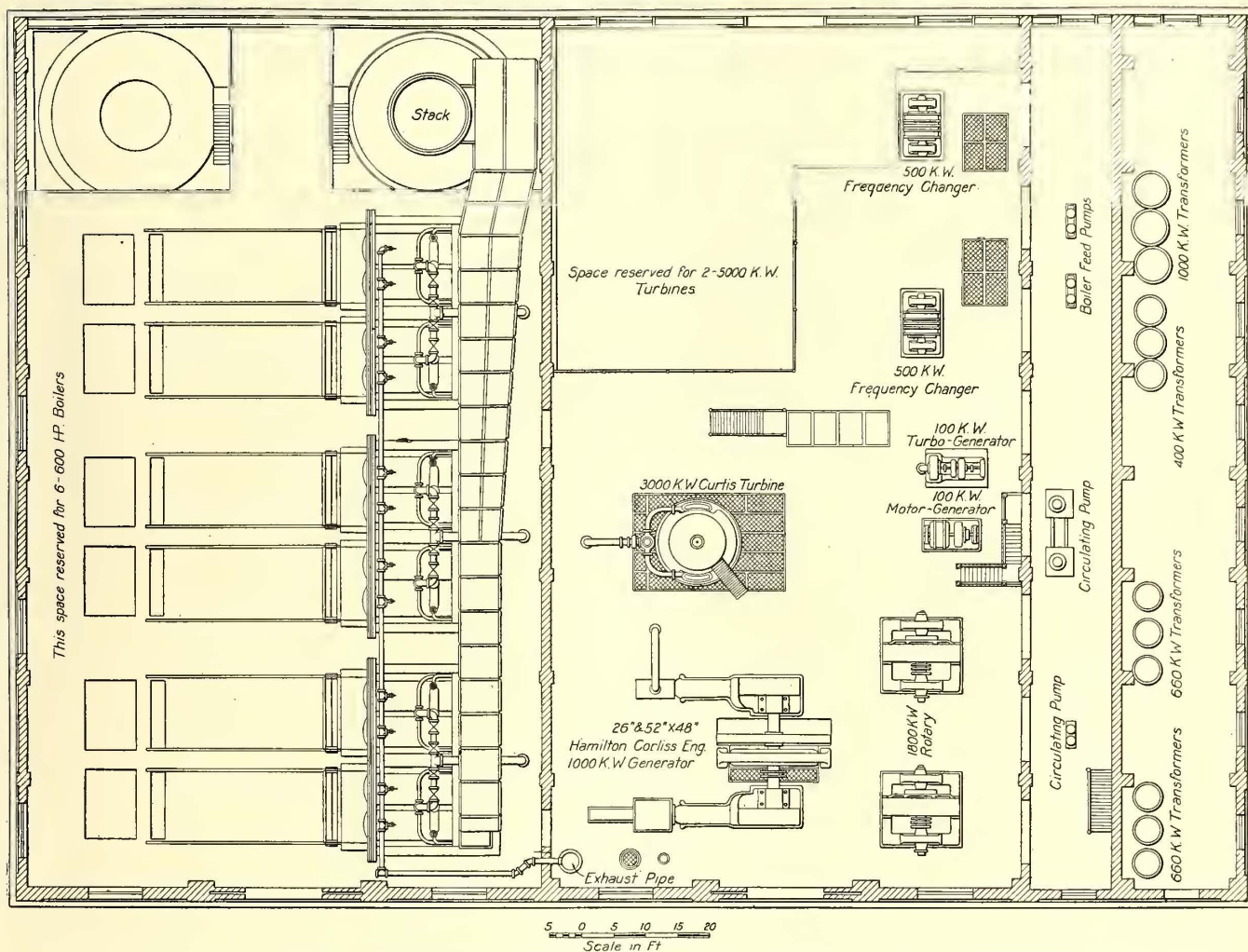
The method of handling fuel as just described presupposes that the coal is small enough for use with the stokers. Whenever lump coal is received the cars are spotted on the approach trestle directly over a steel hopper, which holds two carloads. Beneath this hopper is a motor-driven crusher from which the coal in turn falls directly into another car located on a track at an elevation midway between the main tracks which lead from the bridge approach and the ash track below the boiler-house floor. After a carload of coal has been run through the crusher the yard locomotive takes it around a "Y" and up on to the bridge approach and then into the boiler house above the bunkers.

The motor which drives the coal crusher also drives a

steam piping extends above the engines or turbines to restrict the use of the overhead crane. Moreover, the high-pressure piping and the heavy fittings are easily supported and are in such position that a man can work upon them without ladders or scaffolding.

A free exhaust main, 36 in. in diameter, extends the full length of the engine-room basement and is connected with the atmosphere by a 36-in. spiral-ribbed pipe, extending through the roof of the engine room.

When the boiler equipment is duplicated on the opposite side of the firing aisle the high-pressure steam header will be continued in a loop around one end of both rows of boilers and cross-connected at two points, thus making it possible to subdivide the boiler plant into any desired number of units of two boilers each.



Illinois Traction Power Station—Plan of Station Showing Location of Machinery

winding drum which, with its cable, is designed to pull a gondola car loaded with ashes out of the basement. The cars of ashes, in moving out of the boiler-plant basement, have to ascend a short length of 12 per cent grade. Nevertheless, with the electric winch the entire run of ashes for one day's operation can be removed from the plant in ten minutes.

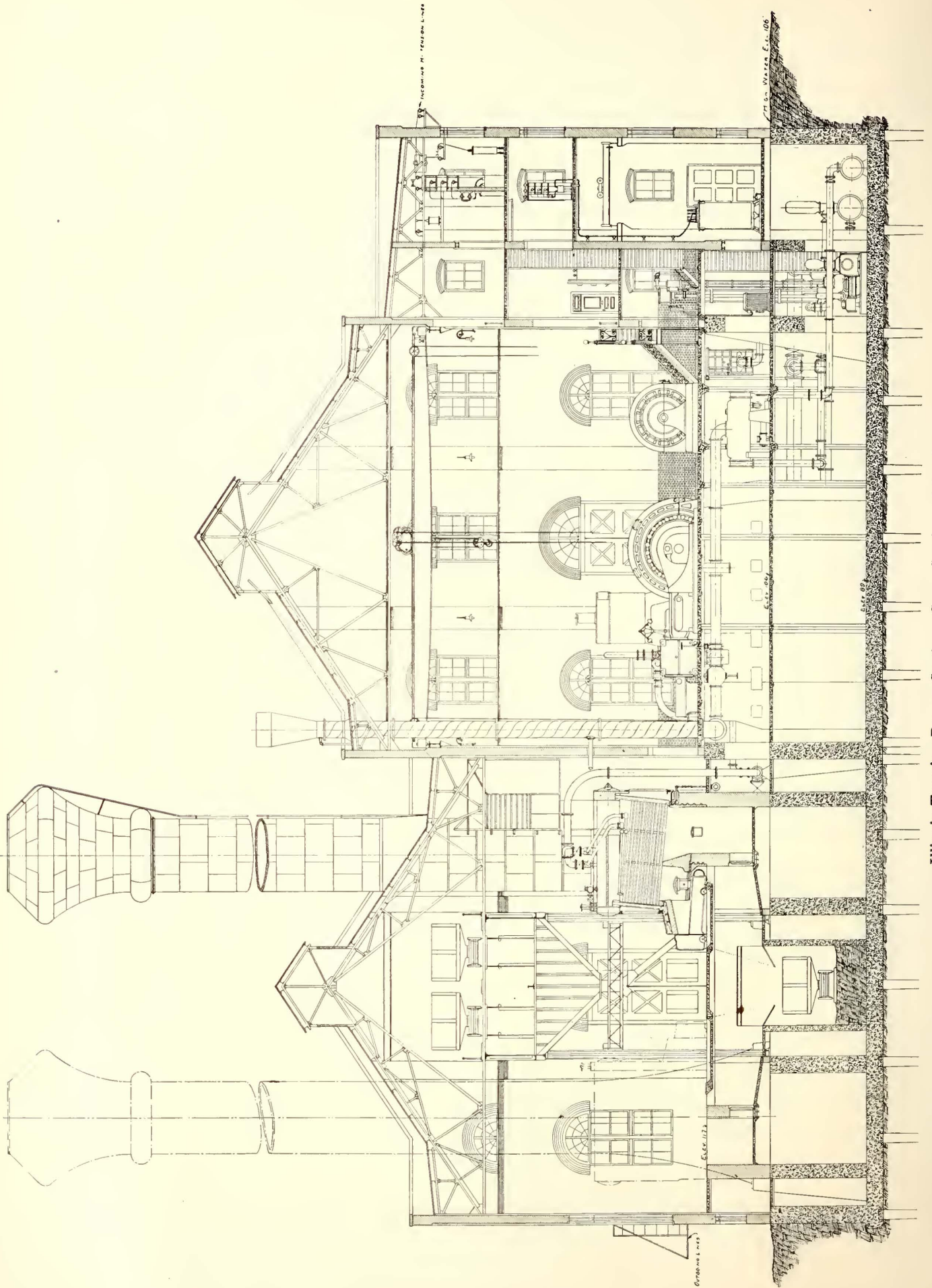
STEAM PIPING

The main steam header is located on the boiler side of the partition wall between the engine and boiler rooms. It is 20 in. in diameter and at an elevation of 8 ft. below the boiler-house floor. The header and its fittings are firmly supported on a row of concrete pedestals. Steam connections from the boilers above are 10 in. in diameter, and the engine connections pass directly through the power-station division wall and up through the engine-room floor to the throttle valves. Because of this arrangement no

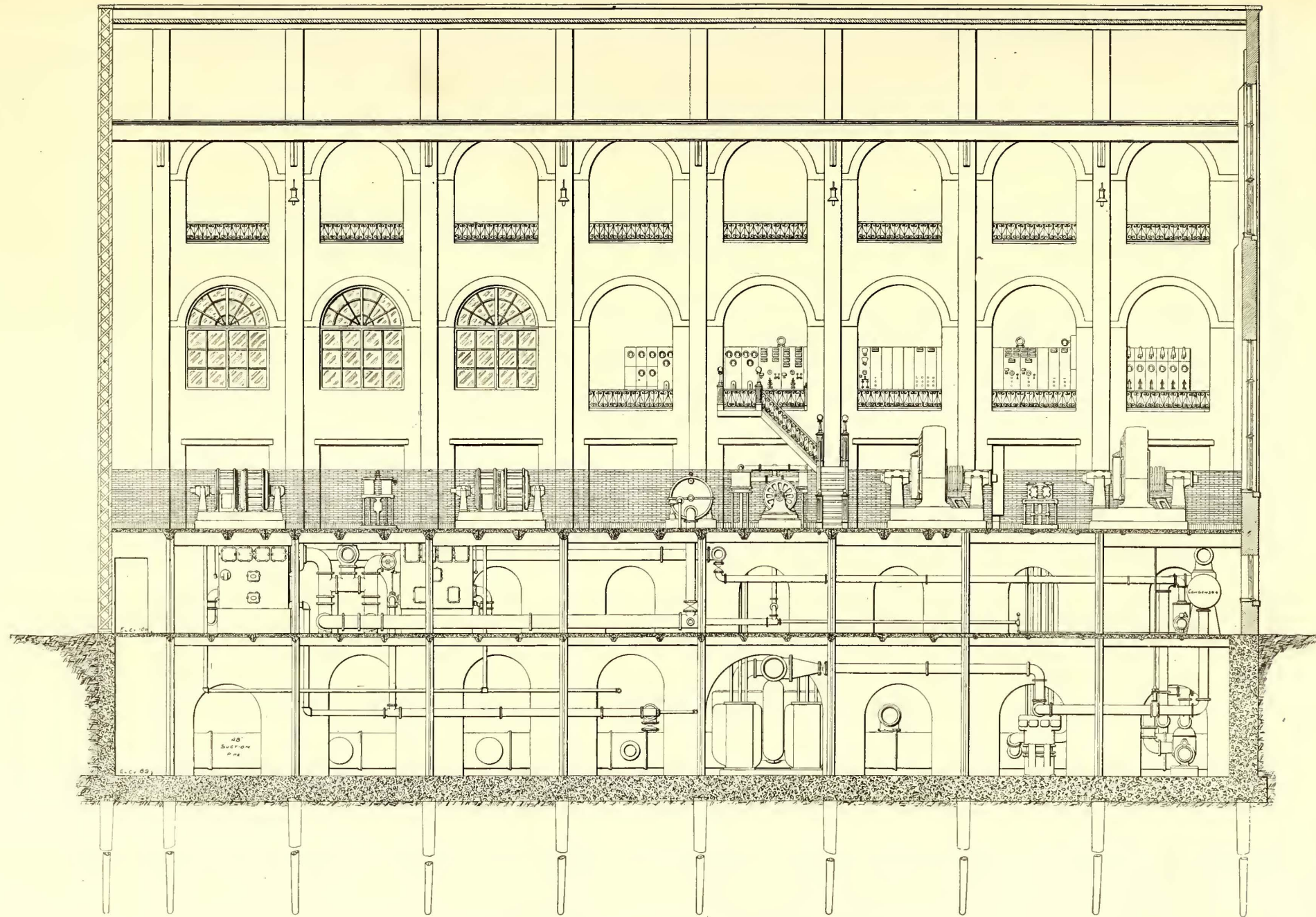
GENERATING EQUIPMENT

The present generating equipment occupies but one-half of the floor space provided for engines and turbines. Thus space is available for doubling the generating equipment if units of the present size are installed, or for greatly increasing the capacity if desired, since the building, sub-foundations, etc., are arranged to accommodate much larger units than now are used. The present main units include one 1000-kw General Electric 2300-volt, 25-cycle generator, driven by a Hooven-Owens-Rentschler cross-compound, horizontal engine with cylinders 26-in. and 52-in. x 48-in. stroke, and a 3000-kw Curtis turbine also delivering 2300-volt, 25-cycle current. These two generating units are run in parallel and the station, when desired, is paralleled over a 33,000-volt transmission line with the Riverton power station located near Springfield, 112 miles away.

Alberger condensers are used for both the Corliss engine



Illinois Traction Power Station—Cross-Section of Station



Illinois Traction Power Station—Longitudinal Section Through Boiler Room

and the Curtis turbine. The turbine condenser is of the base type subdivided into two sections. The engine condenser is of the standard form having 2400 sq. ft. of cooling surface. The wet-vacuum pump for the latter condenser is connected so that it may be used to remove air from the intake and assist the smooth running of the large circulating pumps. All the condensing machinery is located in the

gravity to an intake well near the shore line. Circulating pump suction is taken from this well to the power house, where vertical steam pumps lift the water through the condensers. The sub-basement of the section of the power plant utilized by the electrical galleries incloses the intake and discharge pipes.

The most important feature in connection with the intake conduit is the steel-and-concrete caisson or intake well. This well is connected with the river through a cast-iron bell-and-spigot gravity intake pipe 48 in. in diameter. The pipe is carried in saddles fastened to piling. Originally it was planned to obtain water by means of a gravity intake from the river to the power house, but the presence of quicksand made it desirable to arrange for locating the intake pipe near the surface of the ground.

An illustration shows the arrangement of the gravity suction connections to and from the intake well and also shows the design of the well. The intake well is a steel caisson lined with concrete and having a concrete floor 6 ft. thick. This caisson was built in sections above the surface of the ground and sunk by its own weight. It is 16 ft. in diameter. At the commencement of the work a steel cylinder 16 ft. in diameter and 6 ft. high was equipped with cutting edges



Illinois Traction Power Station—33,000-Volt Busbar Room

basement beneath the generating machinery, as are the pumps for the Turner oil-filtering system and the step-bearing pressure pumps.

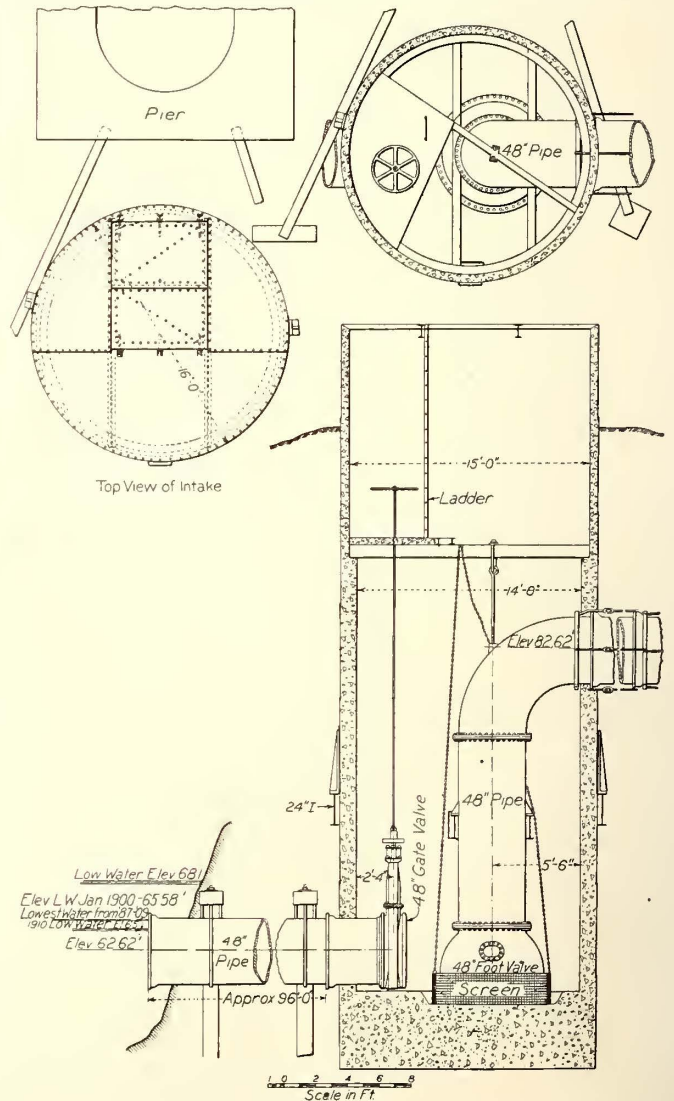
Two 4000-hp feed-water heaters have been installed, one of Cochran and the other of Webster manufacture. These heaters are so connected by piping that either one may be run singly or the two may be run in multiple. They use only the exhaust from the steam auxiliaries.

Two H. R. Worthington boiler-feed pumps, each large enough for the ultimate installation, have been installed. The main boiler-feed pipes leading from the pumps to the boilers are black iron lined with copper. This copper lining has been provided so that any precipitate will not collect on its smooth surfaces as it would on iron pipe.

It is interesting to note the efficiency of the feed-water heating system in purifying the Mississippi River water used for boiler feeding. This water, as taken from the river, contains on an average 16.32 grains of solid matter per gallon. After the water has been passed through the heaters but 5.24 grains of solid matter per gallon remain, and as the river water is soft it is good for boiler feeding.

SUPPLY OF CIRCULATING WATER

The circulating water for the condenser equipment is taken from the Mississippi River and a system of intake and discharge piping has been installed which is sufficient for 28,000-hp engine capacity, the proposed ultimate capacity of this plant. The river side of the power plant is 800 ft. from the average river's edge. Briefly, the water is led by



Illinois Traction Power Station—Section and Plan of Intake

and placed directly over the final location. Then a lining of concrete 1 ft. thick was placed within the shell and as the earthen core was removed the shell sank into the ground. Other steel shells were added until the caisson had been sunk to a depth of about 40 ft. Then the quicksand was reached and it was seen that unless some special provision was made the caisson would sink below the desired

level. Accordingly a temporary concrete bulkhead was placed near the top and air locks were provided. The interior of the caisson then was put under an air pressure of 10 lb. while the work was completed. When the caisson had been sunk to the desired level a floor or base of concrete 6 ft. thick was placed. This extreme thickness of concrete was found necessary in order to give the caisson sufficient weight to overcome its buoyancy.

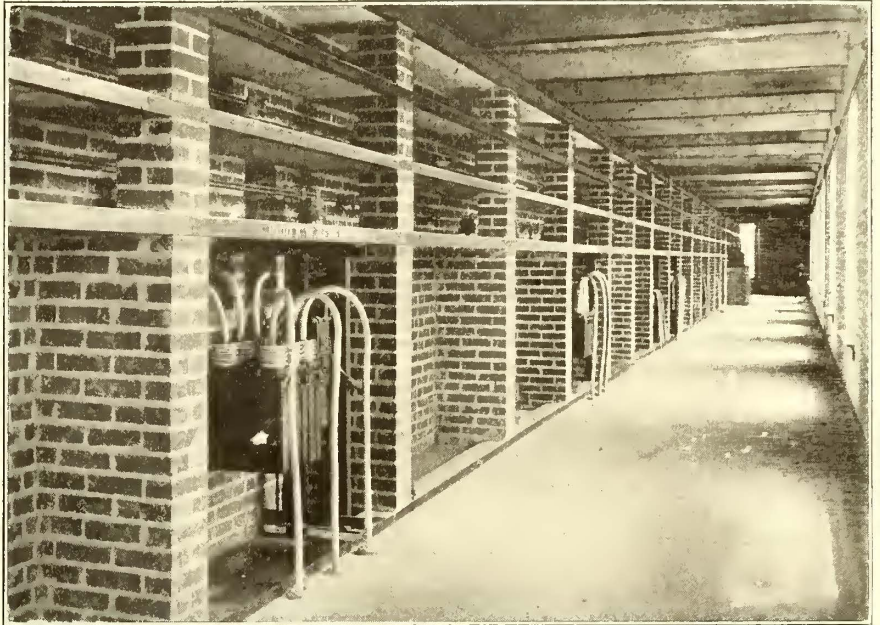
After the caisson structure had been completed the 48-in. gravity intake pipe from the river was installed and provided with a gate valve and operating staff extending nearly to the top of the well. The 48-in. intake connection from the pipe leading to the power house was placed in the well. This is provided with a foot valve and a circular screen which may be raised for cleaning. The intake well is located on the harbor line just below one of the large piers of the McKinley Bridge. This pier rests on solid rock and thus effectually protects the intake well from damage. The connection between the intake well and the power plant is made with 48-in. bell-and-spigot pipe buried at a depth of 18 ft. below the ground surface. The pipe sections are 12 ft. long and weigh 8000 lb. each. Each section of pipe rests on two saddles, each in turn supported by two piles. The three lengths of pipe nearest the caisson are secured to it by tension rods provided with turn-buckles. The piece of land through which this pipe extends is protected from the action of the water by a riprap deflection levee 80 ft. wide located under the approach to the McKinley Bridge.

Within the power station sub-basement the circulating-water pipes connect with the intake openings of two duplex outside-packed steam pumps having water cylinders at the level of the intake pipe and steam cylinders located on the engine-room floor about 30 ft. above. The circulating pump

Two General Electric 1800-kw railway rotary converters. Two 500-kw a.c. motor generators for changing frequency from 25 cycles to 60 cycles for lighting distribution.

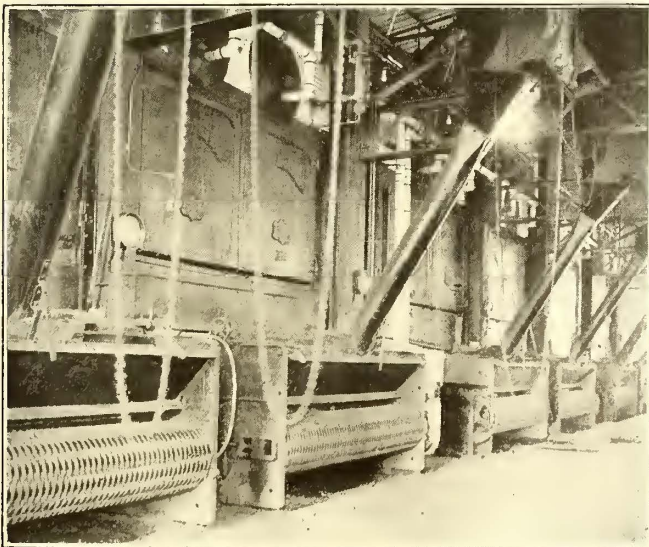
Two Westinghouse exciter sets of 100-kw capacity each, one driven by a motor and the other by a horizontal turbine.

The electrical galleries, as earlier stated, are located in a



Illinois Traction Power Station—2300-Volt Busbar Room

fireproof subdivision of the power plant parallel with the engine room. The sub-basement of this section contains circulating water pipes; the section at the engine-room basement level contains the step-up transformers and above this are a 2300-volt switch room and a 33,000-volt switch room. The switchboard gallery overlooks the engine room and is directly above the pump room. The switchboard, which is largely of Westinghouse manufacture, is 70 ft. long and

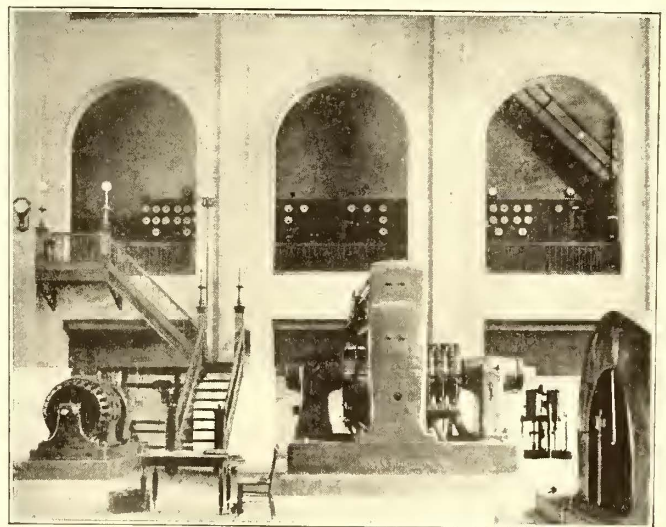


Illinois Traction Power Station—Boiler Room

for the turbine condenser has a capacity of 9000 gal. per minute and that for the Corliss engine condenser 1500 gal. per minute. Both pumps are of Blake manufacture.

ELECTRICAL MACHINERY

In addition to the two 2300-volt, 25-cycle main generating units the following machines have been installed on the engine-room floor:



Illinois Traction Power Station—Switchboard Gallery

contains forty-two panels. Fourteen of these panels are for 2300-volt, 60-cycle lighting distribution to Venice, Granite City and Madison, and carry Terrill regulators for the 60-cycle side of the frequency changers. There are also three exciter panels, three 33,000-volt transformer panels with Westinghouse remote-control oil circuit-breakers, seven extra panels for additional generators and lines, one

engine and one turbine panel equipment with motor-operated speed control, six rotary-converter panels, of which two are not used, and seven d.c. trolley feeder panels.

The switchboard is illuminated by lamps which are placed about 6 ft. in front of the board and are provided with projecting reflectors.

The switchboard transformers and high-tension and low-tension a.c. connections and outlets are symmetrically arranged in accord with the arrangement of switchboard panels. The busbar and transformer sections of the electrical galleries, as already described, are subdivided into three separate rooms, one above the other, each room extending throughout the length of the building. The room at the intermediate elevation contains the 2300-volt buses, which are fed directly from the solenoid-operated oil switches connecting with the main generating units. From the 2300-volt buses current is taken downward through the floor to the transformers in the room below, where it is either stepped up to 33,000 volts for transmission to substations or stepped down to be converted in the rotaries. The step-up transformers are oil-insulated, water-cooled Westinghouse units, three of 400-kw capacity and three of 1000-kw capacity. Provision has been made for duplicating this equipment. The rotary-converter transformers are also oil-insulated and water-cooled, but are of General Electric manufacture. There are six of these, each of 660-kw capacity.

The 33,000-volt connections from the step-up transformers are carried up wall chimneys to the top room, in which the buses and line switches are located. A Westinghouse gravity break fuse on two of each of the three-phase lines connects with a potential transformer located in a fireproof compartment. Current transformers for the switchboard ammeter are placed on each leg. The outgoing transmission lines are protected by banks of electrolytic arresters.

The arrangement of buses in this station is similar to that in the other generating stations of the Illinois Traction System at Danville, Riverton and Peoria, so that operators may quickly learn to handle the equipment in the different stations.

The transformer room is served throughout its length by a 10-ton crane built by the Curtis & Company Manufacturing Company. Sufficient space is available in each of the bus rooms and in the transformer room to double the installation of the electrical apparatus. The bus structures are made with walls of red brick and horizontal markings of marble. The oil switches, which are of the solenoid-operated type, are installed in compartments directly under the bus structures.

The engineering and construction work on this station was executed by the members of the engineering department of the Illinois Traction System, of which department H. C. Patterson, electrical and mechanical engineer, Decatur, Ill., is the head.

HEARING IN REGARD TO FARES ON LONG ISLAND RAILROAD

A hearing was held before J. Sergeant Cram, of the Public Service Commission of the First District of New York, on July 6, 1911, in regard to the extension by the Long Island Railroad of its 5-cent fare zone on its Atlantic Avenue electric division from Warwick Street, Brooklyn, to Railroad Avenue, Brooklyn.

Counsel for the Long Island Railroad explained that the company was prepared to reduce the fare in either direction between Flatbush Avenue and Railroad Avenue to 5 cents and that such reduction would be put into effect as soon as the traffic department of the company could arrange the change. He said that a delegation had been told by Ralph Peters, president of the company, about six months ago that the question of fare would be carefully

considered. Despite this a bill had been passed by the Legislature designed to compel the reduction in fare and imposing severe penalties. This bill the Governor vetoed because it tended to usurp the power of the commission.

The assurance that a reduction would be made satisfied Commissioner Cram and those who were in attendance, and it was announced that a formal order in regard to the reduction would be issued by the commission.

HOOPS FOR TRAIN ORDERS

The Puget Sound Electric Railway, which operates observation-car trains between Seattle and Tacoma, Wash., uses hoops, as shown in the accompanying illustration, for delivering train orders while trains are under way. This plan of operation is followed at any way station where it is



Delivery of Orders with Hoops, Puget Sound Electric Railway

desirable to deliver orders to a train without causing it to stop. Usually the hoops are used for delivering orders conferring rights of trains or giving them a check on the train register, but they are never used for orders restricting the rights of trains.

The hoops used are made of light wood, generally willow, and are fitted with a spring of brass wire to hold the order. The supply of hoops at a way station is equalized by the conductor throwing off a hoop at the same time that the operator delivers one. The train operation on this road is in charge of F. A. Boutelle, superintendent.

The Bradford Corporation Tramways, Bradford, England, operated several illuminated floats over its lines during the recent coronation festivities. The arrangement of these cars was intended to symbolize a crown upon a pedestal, the crown proper being in gold bronze suitably lined. The crown band was perforated, and behind were fixed colored celluloids and lamps representing jewels. On one side of the car was a ribbon with a groundwork of royal blue and the words "Long Live the King—1911." A ribbon on the opposite side of the car carried the words "God Save the Queen—1911," and a gold shield with the monogram "M," in white. About 1050 lamps were used.

Meeting of the Committee on Equipment

At This Meeting the Principal Subjects Discussed Were the Heating and Ventilation of Cars, Light-Weight Car Bodies, Electrical Equipment, Trucks and Couplers.

A meeting of the committee on equipment of the American Electric Railway Engineering Association was held at Indianapolis, Ind., on July 6 and 7. The following members of the committee were present: M. V. Ayres, Boston & Worcester Street Railway; H. A. Benedict, Public Service Railway; J. M. Bosenbury, Illinois Traction System; A. T. Clark, United Railways & Electric Company, Baltimore, and W. Thorn, Board of Supervising Engineers, Chicago. During these sessions letters relating to the committee's work were received from F. R. Phillips, Pittsburgh Railways, and F. G. Grimshaw, West Jersey & Sea Shore Railroad, who were unable to be present. The sessions on the second day were attended by the following members of the Central Electric Railway Association Standardization Committee: H. H. Buckman, chairman, Louisville & Northern Railway & Lighting Company; W. H. Evans, Indiana Union Traction Company; L. M. Clark, Terre Haute, Indianapolis & Eastern Traction Company; C. E. Morgan, Indianapolis, Crawfordsville & Western Traction Company, and R. M. Hemming, Ohio & Southern Traction Company.

HEATING AND VENTILATING

Wray Thorn, division engineer of cars, Board of Supervising Engineers, Chicago Traction, submitted a written discussion on the subject of heating and ventilating cars. This discussion was carefully considered by the committee and will be included in the committee report. Mr. Thorn first classified the various methods of furnishing heat to cars and said that in order to bring out the characteristics of the various methods of heating the types of heating equipment should be considered with regard to the following features: (1) Ability to heat car to uniform temperature. (2) First cost completely installed on car. (3) Maintenance, including repairs, renewals, replacements, etc. (4) Cost to operate. In the case of hot-water heaters this includes fuel and labor only; in the case of electric heaters, power, and in case of hot-air blast heaters, fuel, labor and power. (5) Weight of system complete as installed in the car ready to operate. (6) Effect on insurance rates on car barns and contents. (7) Reliability. (8) Regulation, i. e., ability to regulate the heat to outside temperature. (9) Space occupied. (10) Appearance. (11) Attention required from car crew. (12) Cleanliness, including dust, ashes and obnoxious gases. (13) Adaptability and relation to ventilation systems.

He next called attention to the need for more carefully analyzing the heating requirements when purchasing heaters for different types of cars in different localities. Each type of heater was defined and considered according to the foregoing thirteen qualifications. In the order of their presentation the heating systems considered were as follows: (1) Ordinary coal stoves, which have been largely used on account of low first cost. (2) Hot-air heaters in which the air is heated either by coal or electricity and forced through suitable ducts by a motor-driven fan. (3) Hot-water heaters as generally used on interurban and on some city systems operating large cars. (4) Electric car heaters, as usually installed under car seats.

To present clearly the comparative cost of heating a car by the three modern methods, that is, by forced hot air, water circulation and electric heaters, Mr. Thorn gave a detailed estimate based in general on results obtained in practice. This estimate showed the total cost for one year chargeable to car heating subdivided as follows: Cost of power; repair and maintenance; interest and depreciation; coal; labor of attendance; hauling weight; insurance charge. The committee had several suggestions to make regarding

the detailed figures, which will be incorporated in the report.

Mr. Thorn said that in calculating the energy consumption of electric heaters the following method probably would give the most accurate results: "Obtain from the Weather Bureau the temperature readings for each winter for several years; plot a curve showing variations of temperature for each day of the heating season; find what point of heat is carried for the different temperatures and then plot a power curve from which the average kw-hours per day can be obtained readily."

In connection with the use of hot-water or hot-air heaters he called attention to the tendency on the part of car crews to use less coal than would have been used if the car were kept at a uniform temperature during the time it was in service, while with electric heaters the tendency was to turn on three points when two points would suffice. These conditions had given false ideas of the relative cost of operating the various heating systems. He said that when a practical, low-cost heater regulator was brought out suitable for general use the cost of electric heating would be largely reduced. The cost of car heating would be somewhat reduced and the comfort of passengers considerably increased if storm sash were more generally used. Experiments in the Middle West had shown that on the same type of cars, with the same heating equipment and running on the same street, there was a difference of about 9 deg. Fahr. between the temperature of cars with and without storm sash. The advantage of storm sash for interurban cars was being recognized more widely. He said that the maintenance cost of heating systems would be reduced greatly if more care were given to the installation of new equipment, particularly in the case of electric heaters.

VENTILATION

Mr. Thorn's contribution on ventilation called attention to the need for some standard of air purity which should be selected before making a choice of a ventilating system. Monitor deck or clere-story sash ventilation was ineffective because the ventilating action did not extend far enough down into the car body to change the air in the breathing zone. Studies of ventilation by the monitor deck-window method showed that it was almost impossible to secure a reasonable standard of air purity without the presence of strong drafts and the chilling of the air below the desired temperature. Mr. Thorn discussed the standards of ventilation and air purity required in Chicago, which, based on the maximum standing and seated load, are 350 cu. ft. of air per hour per passenger and not more than ten parts of carbon dioxide in 10,000 parts of air. These requirements are believed to be reasonable, and they can be met by several ventilating systems. Furthermore, he said tests showed that no more energy for heating was required when handling the above amount of air through floor intakes and then over the heating surface than when using deck-sash ventilation. He said that an essential feature of a ventilating system was a set of air intakes placed in the floor or near it and so connected with the heating system that the cold air must pass over the heating surface before coming into the car body. Provision should be made for excluding or separating the dust.

Mr. Thorn then defined the various types of ventilating systems, and concluded by saying:

"From the results of tests it is safe to say that there are now on the market several ventilating systems for cars which will provide a reasonable standard of air purity and which are not very high in first cost or cost of maintenance."

DISCUSSION ON HEATING

In discussing Mr. Thorn's remarks on heating, Mr. Benedict said that coal stoves could be made as safe as hot-water heaters if the stoves were carefully inclosed in heat-resisting casings. Mr. Bosenbury said that the insurance conditions varied greatly, and the roads which had unheated carhouses or stored their cars in open yards could reduce the fire risk by pulling the fire in the stoves. This, however, could not be done with hot-water heaters on account of danger of freezing.

It was stated that the Pittsburgh Railways Company had just purchased fifty cars with heating equipment which included thermostats operating in connection with the electric heaters. The thermostats will be set to cut off the current when the temperature of the air in the car exceeds the temperature required by city ordinance. These instruments were designed so that the heater circuit could be operated on one, two or three points and yet be governed by the thermostats. It was expected that the use of thermostats would reduce the total energy consumption in electric heaters by practically 50 per cent.

A general discussion then followed on the maintenance costs of hot-air versus hot-water heating equipments, and it was decided that not enough experience had been had with the forced hot-air heater to rate definitely its maintenance. The variation in radiating qualities of hot-water pipe as influenced by kind and color of the paint used in covering the pipes was also discussed. In connection with Mr. Thorn's assumption that the peak load on the power plant came in the heating season, Mr. Benedict gave a word of caution regarding the calculations necessary for additional feeder copper to provide for distributing energy for electric heating. He had had the feeder capacity of one road figured on the basis of the amount of additional copper necessary if electric heaters were to be used instead of stoves. Theoretically this would require the purchase and erection of \$200,000 worth of additional feeders, but on careful study it was found that on many sections of the road actual conditions would not require the additional copper, and so the real additional investment cost might safely be reduced to \$50,000.

In discussing the proper methods of installing electric heaters Mr. Bosenbury called attention to trouble which the Illinois Traction System had had with some tight-fitting conduit in which condensation had accumulated. Other members of the committee had experienced trouble from wash water getting into flexible conduit. Conduit was considered preferable for use if good inspectors saw that it was well installed. The Illinois Traction System had successfully used metal hose for conduit.

The committee next discussed the proper amount of fuel to be included in Mr. Thorn's estimate of coal consumption per day for hot-water heaters, and also the proper cost of current to be used in basing the energy charge for electric heaters. As the result of the latter discussion it was the opinion that 1.4 cents per kw-hour would be approximately correct for energy delivered to the car.

Regarding the cost of fuel Mr. Bosenbury said that an estimate had been made covering all the interurban cars of the Illinois Traction System for the season of 1909. Using the total number of cars equipped with hot-water heaters and the total amount of fuel burned, which was coke, the cost for fuel per day per car was 16.5 cents.

LIGHT-WEIGHT TRUCKS

Mr. Benedict's contribution on light-weight trucks was next presented. He showed data, photographs and blueprints of a number of light-weight trucks, and the committee discussed these with a view to incorporating them in its report. Considerable interest was shown in Mr. Benedict's description of the Halsey radial truck, which had been operated in owl-car service on one of the large Eastern city systems for nearly a year. Other trucks considered were those manufactured by the Mohawk Weld-

ing Company, Schenectady; Baldwin Locomotive Works, Standard Motor Truck Company and The J. G. Brill Company. Mr. Clark said that by giving careful attention to the reduction of weight he had co-operated with The J. G. Brill Company in the removal of 500 lb. of weight from one of its types of trucks. The committee invited Mr. Clark to prepare a discussion on the reduction of truck weights by redesigning small castings and parts.

LIGHT-WEIGHT CAR BODY

Mr. Ayres read a contribution for the committee report which had been prepared by Mr. Phillips, giving his ideas on light-weight car bodies. He spoke of the development in designing methods which had resulted from the increased attention which the roads recently had given to the subject of car weights. The use of straight-sides for cars assisted in reducing the weight and worked out very well in the designs. Mr. Phillips also discussed the use of steel underframes and bodies.

Mr. Thorn spoke of the good service obtained with open-hearth cast-steel bolsters on 1000 cars in Chicago. These had been purchased under rigid specifications. Only two had bent and these had been straightened at low cost. Mr. Bosenbury favored the use of cast-steel bolsters for interurban service, but said that the diaphragm type was lighter. However, it was subject to weakening by rust. The committee then discussed the use of steel in the superstructure and the use of wooden posts with steel-girder side frames. It was the opinion of several members that the latter combination of parts would withstand severe service satisfactorily. The relative merits of the arched and monitor type roof were next discussed. The consensus of opinion was in favor of the arch roof. Several members spoke of the increased use of refined steel in car design.

Mr. Phillips presented as part of his contribution a description of a car in which the weight had been reduced by 25 per cent. He also suggested subdividing the parts of a car when comparative weights were being considered. These subdivisions for weight comparison would be (1) bodies, (2) trucks, (3) power brakes and (4) electrical equipment. The committee after a long discussion thought it desirable to add subhead No. 5, which would include the auxiliary equipment of a car body that might or might not be the same in different parts of the country. This subhead No. 5 would be used to compare the weights of all such fittings and parts as seats, parcel racks, toilet equipment, fire extinguishers and other miscellaneous fittings and equipment which if considered as a part of the car body might affect the true merit of the structural design.

Mr. Bosenbury spoke of the necessity for taking into account the operative speed in designing car bodies. Because of a shortage of equipment his company had operated some large city cars in interurban service and shortly thereafter found them to be racked on account of the high speeds, while similar cars in city service at St. Louis were in excellent condition. The committee then discussed the choice of a unit for comparing the weights of car bodies. Mr. Phillips suggested pounds per cubic foot, but the general opinion of the committee was that pounds per square foot of floor area inside of the finish would be the best unit.

COUPLERS

On Thursday evening a long discussion took place on interurban car couplers. Mr. Bosenbury led this discussion by presenting an extended history of the M. C. B. coupler, which was illustrated and accompanied by reports of several tests and other data. He also described the development of the present M. C. B. type coupler on the Illinois Traction System. A drawing of this type of coupler is reproduced.

ELECTRICAL EQUIPMENT WEIGHTS

At the beginning of the second day's session Mr. Ayres read a contribution for the committee report on methods of reducing the weight of electrical equipment. This was based on the following methods which were not inconsistent with each other: (1) Redesigning and excluding some

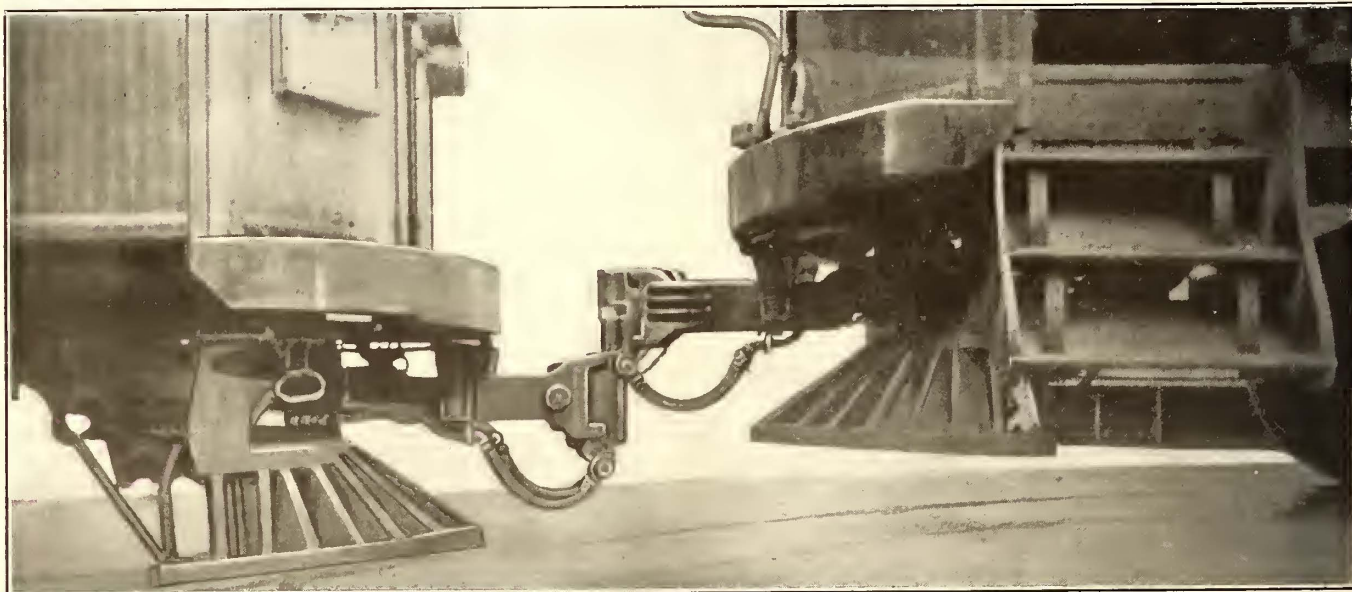
for couplers, even though the Central Electric Railway Association had recommended it.

Mr. Bosenbury said that if vertical uncoupling was prevented, as in some types of interurban couplers, then in event of derailment the platforms or coupler anchorages would be severely damaged. While it might be necessary, on account of rough track at railroad crossings or curves, greatly to increase the height of the knuckle on M. C. B. couplers, Mr. Bosenbury did not believe any limiting stop should be added to prevent the parting of the coupler in event of derailment.

Mr. Bosenbury mentioned one steam road which used M.C.B. knuckles 21 in. high which were designed to accommodate the difference in elevation occurring when handling cars on and off ferry boats. The Illinois Traction coupler had a 16-in. knuckle and had frequently been operated in steam freight as well as passenger service. Close observation showed that the vertical movement was about 9 in. in regular service on the interurban lines. The worst condition for vertical uncoupling was at a multiple railroad crossing on a curve where one of the steam railroad tracks was higher than the other.

ing horizontal angularity of more than 7 deg. Manufacture of these couplers was not restricted by patents. The National Malleable Castings Company and the Simplex Coupler Company had at times furnished these couplers, which were designed with a view to universal service with all M.C.B. couplers, whether or not those couplers had ribs and reinforcements on the sides. Experience had shown that they would operate satisfactorily with all couplers used in steam service. The use of a spring drawbar carrier was unnecessary. Mr. Hemming said the C.E.R.A. standards called for a "flexible" rather than a "spring" drawbar carrier and required no particular design. Mr. Evans said it was unfortunate that the Central Electric Railway Association committee had made sketches to illustrate its standards. It would have been better to have used only dimensions and thus no ambiguity would have occurred. Mr. Evans also called attention to the need on the part of the American Association for adopting a coupler conforming to steam railroad practice so that renewals could be made on foreign roads, whether steam or electric.

Mr. Bosenbury said the Illinois Traction coupler had the standard M.C.B. shank and that the vertical faces of the



Extreme Variation in Height of Couplers on Interurban Cars Due to Change of Grade .

Mr. Evans said that while he was not a member of the Central Electric standardization committee when it adopted its present M.C.B. type of coupler he had been a member when standard axles were adopted several years ago. This was two years in advance of the adoption of standard axles by the American Association and the latter association had found it necessary to make only a few slight changes in the C.E.R.A. standards. Mr. Evans felt that the Central Electric Railway Association would be much pleased if the American Association should adopt a standard coupler having similar lines to that which the C.E.R.A. had adopted, but eliminating any errors which might have crept in. It would be very desirable to hasten the adoption of some standard coupler.

Mr. Bosenbury said that whatever specifications were drawn up for couplers should provide leeway for improvements in design and the addition of new features. His road had tried a number of patented couplers and had spent a considerable sum in standardizing all car platforms so that the M.C.B. coupler height could be used. As a result of the study of couplers the design now in use was adopted. This had an M.C.B. contour. The knuckles were 16 in. high and the casting had an extension on the guard-arm side and a shoulder on the other which engaged with similar projections and shoulders when intercoupling, thus prevent-

M.C.B. contour in it had been slightly curved to permit breaks in grade of 7 per cent. A height of 9 in. of the coupler face was straight to provide the full M.C.B. wearing surface.

Mr. Evans said that such slight compromises were desirable because when radial couplers were used on sharp curves the cars were canted and unless one coupler had some freedom of movement on the other they would tend to twist. Mr. Bosenbury said that his company had 300 cars equipped with standard couplers, which were operating satisfactorily. So far as rubbing of the faces was concerned he said that some steam roads had considered lubricating the knuckles.

Mr. Ayres understood from the preceding discussion that the Illinois Traction type of coupler as described by Mr. Bosenbury would meet all the C.E.R.A. specifications except that it did not have a center lock or a spring carrier.

Mr. Evans spoke of the need for definite recommendations to guide the design and hasten the adoption of a standard coupler.

Summing up the discussion thus far, Mr. Ayres said that the committee was agreed that couplers must intercouple with the M.C.B. type couplers, must operate radially and must be designed to accommodate sharp curves and breaks in grade.

Regarding the severity of breaks in grade and curves on

some interurban roads Mr. Evans did not feel that too much weight should be put on local conditions, but rather the coupler design should conform to modern track-work practice.

Mr. Bosenbury again spoke of the desirability of having strictly vertical-plane couplers which would part automatically in event of the overturning of one car. He showed photographs of derailed cars which illustrated this point and he said that if rigidly locked coupler heads had been used the car platforms or coupler anchorages would have been severely damaged. Similarly, if the extension arms on the sides of the couplers had been restricted in vertical movement, the coupler heads or platforms must have been injured when the car was derailed.

Mr. Bosenbury said that his first idea for adding the brackets to the sides of the couplers came from a test which he had made in his own shops. Two couplers—a Tower and a Simplex—had been mounted so that they could be tested to destruction by bumping with a steam locomotive. During the test it was seen that the guard arm on one of the couplers gouged the side of the other coupler. This showed the need for extensions on the sides to prevent horizontal movement. The next traction couplers made were built with side brackets and guard arm extensions, but the design was too weak for the service and a heavier pattern was made. Thus the size of the coupler had grown with the service until now it was thought that a design had been secured which was suitable for all electric and steam railway interchange service. The couplers on the 62-ton locomotives, which at times hauled forty cars in a train, were manufactured by the Simplex Coupler Company according to the Illinois Traction System's standard design.

COUPLER EXHIBITION TEST

Immediately after lunch on the second day of the committee meeting the American and Central Electric committees, together with representatives of several coupler manufacturers, were taken for a ride over the Indianapolis Traction & Terminal Company's line leading to the west end of the city on two cars of the Indiana Union Traction Company equipped with McConway & Torley couplers of M. C. B. design. The couplers were not provided with any horizontal or vertical locking devices. The test train was run to a railroad crossing at the edge of the city, where there was a severe break in the track grade and the action of the couplers was observed under severe operating conditions. On the return trip the train was run around a "Y" of 35-ft. center radius to show the extreme platform movement and the radial action of the couplers.

COUPLER DISCUSSION CONTINUED

After the test run the committee reassembled and continued the discussion on couplers. Mr. Clark said the cost of installing M. C. B. couplers on the cars of the Terre Haute, Indianapolis & Eastern Traction Company was about \$150 per car complete with air-pipe extensions and fittings conforming to C. E. R. A. specifications. Mr. Bosenbury said that on the Illinois Traction System the cost was \$87 per car for couplers installed.

Mr. Ayres then read a contribution from Mr. Grimshaw on standard couplers and air signal and control connections. Mr. Grimshaw said that the requirements of interchange justified the vertical plane M. C. B. type coupler and some special attachments to provide against lateral buckling. Mr. Grimshaw recommended that the association arrange to learn by test the requirements that must be met and make definite recommendations on the coupler problem.

Mr. Buckman spoke in favor of locking couplers to provide against uncoupling on breaks in grade. Mr. Thorn thought that if couplers were provided with locking devices it would be very difficult to recouple on a bad break in grade if the couplers had once parted or if it was necessary to make up a train on a sharp curve.

Mr. Bosenbury spoke of the need for having a design of coupler to take the buffing strains, and criticised the reduction of section which might be necessary if center locking was adopted. He also favored the adoption of a slotted knuckle to permit the use of shackle bars until all roads should be equipped with standard couplers.

L. M. Clark said that the committee ought to decide upon some controlling recommendations which would guide purchasers along the right lines until a completely designed coupler could be accepted as standard by all the roads.

Mr. Bosenbury said such designs were desirable and that they should have in view the possibility of interchange of coupler shanks with steam roads. He presented a long argument in opposition to limiting the vertical movement of couplers, and said the straight M. C. B. coupler with the high knuckle, as used on the Illinois Traction System, successfully handled heavy 57-ft. sleeping cars when pushed around 33-ft. radius curves. He was now applying similar couplers to freight cars 65 ft. 8 in. long. These cars had 55-ft. 8-in. truck centers and were designed for handling theatrical scenery.

Mr. Evans suggested that later it might be found desirable to have what might be called a standard electric railway contour with the understanding that this would conform to the M. C. B. contour and make intercoupling possible, but would have the vertical faces curved over a part of their height to provide against cramping on sharp vertical grades and curves.

DISCUSSION BY COUPLER MANUFACTURERS

The committee next put the following question to representatives of the coupler manufacturers for a five-minute discussion by each: What are your arguments for or against the recommendation by the committee of a coupler which does not have horizontal or vertical limiting devices?

Mr. Tomlinson, of the Ohio Brass Company, spoke first. He said in part that it was desirable for a pair of couplers in service to be as nearly like a straight bar as possible because then the combination would be best able to resist stresses. The M. C. B. coupler without provision for horizontal locking would open sidewise as soon as it was worn. The high knuckle, if provided to prevent vertical uncoupling, would bend and strain the carry iron and framing of a car. After considerable study it had seemed to him that the only way to meet the conditions of interchange service was to lock the coupler heads solidly and use a yielding carrier. He thought that the extensions or pockets on the side, as used with some couplers, would interfere with the reinforcing ribs on the outside of the Buckeye, Major and Simplex couplers. Extremely high knuckles would also interfere with the close coupling of car platforms. Because of these reasons he had put the lock on the inside of the type of coupler which bore his name.

I. H. Milliken, of the McConway & Torley Company, then spoke. Mr. Milliken said that no brackets were used on the sides of the couplers made by his company because experience had shown that they were not necessary. If continued use should indicate that the guard arms would prevent horizontal angularity, then this condition could be taken care of by making the present coupler stronger. The addition of guard arms of sufficient strength would increase the weight of the couplers about 100 lb. per car. When guard arms were used they had to be closely in contact with the brackets on the opposing couplers. This interfered with coupling unless 1/2-in. play was allowed, and then angularity occurred when cars were being pushed. Regarding the vertical movement of the coupler, Mr. Milliken said that if brackets were used on the sides of the coupler and vertical stops were carried on the brackets, then there would be interference on sharp curves and the stops would be broken off. With many cars as now operated the coupler movement in actual service was not so severe as calcu-

lations seemed to show. The adoption of devices to prevent the free movement of coupler heads vertically would place undue strain on the platform sills and coupler anchorages. His company, he said, was making knuckles as high as 15 in. and obtaining good results. Those couplers of his company which the committee had seen in operation had knuckles only 11 in. high.

The next speaker was Herbert Van Dorn, of the W. T. Van Dorn Company. Mr. Van Dorn said that if the stops were not put on the coupler brackets and a long train of cars was handled, buckling would occur on account of the accumulation of slack. Steam roads overcame the tendency to buckle in long passenger trains by the use of spring buffers, which kept the coupler under tension. Because of this reason his company had put the extensions and pockets on the outside of the couplers to provide against lateral movement. These extensions and pockets lined up the couplers to positive fits when a coupling was being made and also prevented buckling out. With such couplers a coupling could be made with couplers several inches more out of line than when couplers without extensions were used; thus time was saved in switching. In the Van Dorn type of coupler the extensions and pockets were placed far enough back to clear the lugs on all heavy, reinforced steam railroad couplers. When the Van Dorn coupler was first designed a number of heavy steam railroad couplers were purchased and experimented with so that practical results were obtained and no interference with lugs had followed. He also stated that if the high knuckles were used it would be impossible to place the couplers so that the car buffers would come close together unless the drawbars were of the same radius as the buffer bands. The knuckle on the Van Dorn coupler was 11 in. high and the stops on the top of the pockets prevented uncoupling when the cars passed over severe breaks in grade.

W. H. Bloss, Ohio Brass Company, said the center-locking feature of the Tomlinson coupler was designed not only for convenience of operation, but also for safety. The interlocking lug entered into the opposite knuckle far enough to hold the coupler in line so that cars would not come uncoupled even if the tailpiece were broken. He felt that his company was offering the regular M. C. B. coupler with a safety device added. The interlocking feature was used because it was thought desirable to have the coupler heads rigid.

Mr. Milliken called attention to the fact that when M. C. B. couplers were worn $\frac{5}{8}$ in. between the knuckle and the guard arm they needed attention, but would not come unlocked.

RECOMMENDATIONS OF THE COMMITTEE

After the remarks by the coupler manufacturers' representatives the committee prepared tentative recommendations for inclusion in its report. So far as determined these will require couplers to have the following characteristics:

1. Must couple by impact with all M. C. B. couplers now used by steam roads.
2. Must have radial drawbar.
3. Must provide for successful operation over irregularities in grade met in interurban practice.
4. It is desirable that the shank have such section as to be readily replaced by an M. C. B. coupler in emergency.
5. Must be so constructed as to limit lateral movement in head to not more than 8 deg. between the longitudinal axes of the two couplers, and when two similar couplers are intercoupled must withstand coupling impact and the stresses occasioned by pushing cars around curves.
6. All makes of interurban couplers must couple and operate properly with each other.
7. There should be an arrangement for uncoupling without necessity for employees getting between cars.
8. The faces of the knuckle, vertically, shall be 11 in. minimum and 16 in. maximum and preferably shall be provided with slots for shackle-bar connections.

FARE HEARING IN MASSACHUSETTS

A hearing was held on July 11, 1911, before the Massachusetts Railroad Commission on the petition of the Middlesex & Boston Street Railway for permission to continue the practice of charging 6 cents on its Newton Street Railroad division when transfers are issued to its connecting lines. The Middlesex company comprises the Newton & Boston Street Railway, Newton Street Railway and two or three smaller lines and controls the Lexington & Boston Street Railway. All these lines except the Newton Street Railway charge a 6-cent fare and issue transfers without extra charge. The Newton Street Railway, operating mainly in Newton and Waltham, charges 5 cents on its own line and 6 cents when a transfer to a connecting division is issued.

The attorney for the company stated that the amount received from the extra cent for transfers netted a profit of \$5,433.35, after deducting from the total amount received the amounts paid the connecting lines. This charge he claimed was justified by the increased cost of maintenance and better service rendered than originally prevailed. The company was first granted permission to make this added charge about two and one-half years ago, and while the net revenue from this source is comparatively small, the company claims that it is a proper charge. The Middlesex & Boston Street Railway declared a dividend for the year ended June 30, 1911, of 5 per cent on its capital stock of \$1,462,000. A surplus of \$2,000 was left, but no allowance was made for depreciation. The citizens of Waltham and Newton appearing at the hearing claimed that the charge was unfair and unnecessary.

George Cox, acting manager of the Middlesex & Boston Street Railway, argued that when the roads comprising the present system were built and passengers were carried for a 5-cent fare the business was done at a loss. The proprietors did not realize the fact until some time had passed and the equipment had to be taken care of or renewed. At present, he said, the physical condition of the property was better than ever before, and it had been brought about by the added revenue provided by the 6-cent fare.

Mayor Walker, of Waltham, asked whether the company would favor the idea of carrying laborers during stated hours of the day without exacting the added 1 cent for transfer. Mr. Cox replied that he did not consider it good policy for a transportation company to make cut rates for any special class of passengers. The business furnished by the laborers is necessary, he said, to make a street railway pay at all, and if discrimination were to be made in their favor the company would suffer financially.

The hearing was adjourned to some date between July 20 and Aug. 1, when the company will present a detailed report of its condition.

From Aug. 1, 1910, to June 30, 1911, the Newton Street Railway division of the Middlesex & Boston Street Railway received the following revenue on account of charging 1 cent for each transfer issued:

Total transfers issued, 678,376, at 1c.....	\$6,783.76
Less amount paid—	
Lexington & Boston Street Railway, for 42,139 at $\frac{1}{2}$ c. add'l.	210.69
Newton & Boston Street Railway, for 227,944, at $\frac{1}{2}$ c. add'l.	1,139.72
	\$1,350.41
Net gain to Newton Street Division.....	\$5,433.35
Gross passenger receipts, Newton Street Division of the Middlesex & Boston Street Railway Company, Aug. 1, 1910—	
June 30, 1911.....	\$354,934.16
Passengers carried.....	7,775,042
Transfers issued.....	678,376
Transfers received.....	670,998

The Swiss government has just granted a concession for the construction of a 19-mile narrow-gage electric railway from Meiringen to Engelberg, over the Joch Pass. The new line is to be built by the same company that constructed the electric railway from Stansstad to Engelberg.

HEARING ON JOINT RATES AND THROUGH ROUTES IN NEW YORK

A hearing was held before Commissioners Willcox, Maltbie, Eustis and Cram, of the Public Service Commission of the First District of New York, on July 6, 1911, on motion of the commission as to rates of fare upon connecting or intersecting lines of street railways in the Borough of Manhattan. The Third Avenue Railroad and the other companies of which Frederick W. Whitridge is receiver were represented by William D. Guthrie, of Guthrie, Bangs & Van Sinderen. The Metropolitan Street Railway was represented by Charles F. Mathewson and J. P. Cotton, Jr., of Masten & Nichols. The Central Park, North & East River Railroad was represented by Chase Mellen. The Second Avenue Railroad was represented by Brainard Tolles. The Twenty-eighth Street & Twenty-ninth Street Crosstown Railroad was represented by Julius Mayer. The commission was represented by Arthur Du Bois and Oliver C. Semple, of counsel.

Mr. Du Bois said that he had the names of a number of gentlemen who desired to speak, but asked to be permitted to call E. G. Connette, the transportation engineer of the commission, and offer in evidence a map which Mr. Connette had prepared showing the points of intersection of the surface lines in Manhattan Borough, the points at which transfers were given prior to the general disintegration of the systems in 1908, and the transfers that have been abolished since then. On this map the various surface lines were indicated by different colors and the transfer points between lines of the same company were indicated by colored dots or dashes. Points where transfer stations formerly existed were marked by a red circle. Where one company now transfers to another two colors were shown.

Mr. Connette was excused at this point to permit the introduction of testimony to show the necessity of restoring the transfers. One of the witnesses, Millard J. Bloomer, of the Harlem Board of Trade, asked if he was right in his understanding that Chairman Willcox, of the commission, had said that the board had power to order the restoration of the transfers. The section of the law covering this point was read and the witness repeated his question. Commissioner Eustis then explained that that commission did have the necessary right if the facts warranted an order and that the hearing was being held to determine just that point. Mr. Bloomer asked why it was that one could ride on three cars in the Bronx on a transfer with coupons attached. Commissioner Eustis, who represents the Bronx on the commission, said that the lines in the Bronx do not claim that it is confiscatory to give transfers while the lines in Manhattan do make such a claim.

Mr. Connette was recalled. In his department records had been kept and observations had been taken showing the extent to which 107 transfer points of the total of 151 abandoned and indicated on the exhibit were used before the abolition of the transfers at these points. Briefly, 219,773 persons transferred in a day at the 107 transfer points before the abolition of the transfers, whereas 73,378 persons left the cars after the abolition of the transfers. The number of passengers inconvenienced was estimated at 146,395.

Mr. Guthrie took exception to the methods adopted in reaching this conclusion in regard to the number of passengers inconvenienced by the discontinuance of the transfers. Taking the first entry in the table, the transfer point at 145th Street and Amsterdam Avenue, which showed the number of persons transferring before the abolition of the transfers to be 3607 and the number of passengers leaving the cars after the abolition of the transfers to be 2235, he said that the witness had gratuitously assumed that the difference between these two figures, namely, 1372, represented the number of people who had been inconvenienced and who would otherwise have asked for transfers. He

said that "if there ever was anything more absurd as a basis of proof it has not been called to my attention."

A. F. Weber, chief statistician of the commission, testified that the total revenue car miles of the surface lines in Manhattan in 1908 was 60,719,724, as compared with 55,257,283 in 1909; that the number of revenue passengers in 1908 was 366,690,345 and in 1909 only 362,077,655, and that the number of transfers collected in 1908 was 196,672,167, as compared with 139,607,266 in 1909, or a decrease of more than 57,000,000.

Mr. Weber also offered in evidence a statement which he had compiled from the annual reports of the companies in Manhattan from 1908 and 1909 showing the increase in the fare passengers and the annual percentage of increase. The largest number of discontinuances of transfers by the companies was in the latter part of the fiscal year ended 1909. For the year ended June, 30, 1909, the decrease in the number of fare passengers was more than 4,500,000, or 1 1/3 per cent. In the Borough of the Bronx, where no transfers had been discontinued, the increase in

TABLE SHOWING THE NUMBER OF FARES COLLECTED, THE ANNUAL INCREASE IN FARE PASSENGERS AND THE ANNUAL PERCENTAGE OF INCREASE BY YEARS ON THE SURFACE RAILWAYS IN MANHATTAN AND THE BRONX.

Year ended June 30.	Number of Fares Collected.		Annual Increase in Fare Passengers.		Annual Percentage Increase.	
	Manhattan.	Bronx.	Manhattan.	Bronx.	Manhattan.	Bronx.
1899.....	343,559,120	17,295,761	38,443,582	1,330,491	12.6	8.3
1900.....	360,002,672	21,364,690	16,443,552	4,068,929	4.8	23.5
1901.....	373,569,677	26,992,990	13,567,005	5,628,300	3.8	26.3
1902.....	388,947,169	28,020,185	15,377,492	1,027,195	4.12	3.8
1903.....	396,570,432	30,714,781	7,623,263	2,694,596	2.0	9.
1904.....	389,928,464	34,763,809	*6,641,968	4,049,028	*1.7	13.
1905.....	374,554,075	37,124,805	*15,374,389	2,360,996	*3.9	6.
1906.....	391,798,063	39,893,116	17,153,988	2,768,311	*4.6	7.7
1907.....	377,017,192	42,186,533	*14,690,871	2,293,417	*3.8	5.9
1908.....	366,690,345	44,237,229	*10,326,847	2,050,696	*2.7	4.5
1909.....	362,077,665	50,671,779	*4,612,680	6,434,556	*1.3	14.

*Decrease.

TABLE SHOWING THE NUMBER OF JOINT RATE PASSENGERS BETWEEN THE METROPOLITAN STREET RAILWAY AND THE CENTRAL PARK, NORTH AND EAST RIVER RAILROAD.

	Receivers Met. St. Ry.		Central Park,
	Number at		North & East River.
	4 1/2 Cents.	2 Cents.	Number at 3 1/2 Cents.
December 1910.....	19,379	2,280	19,443
January, 1911.....	95,825	10,613	96,399
February, 1911.....	83,695	8,802	83,792
March, 1911.....	91,022	9,206	91,522
April, 1911.....	86,654	8,832	87,432
Total	376,593	39,733	378,588

There are also reported a certain number of passengers at 0 cents.

the number of revenue passengers for the same period was upward of 6,000,000, or 14 1/2 per cent. A statement was offered in evidence showing the results of operation of the joint rate in force on the Fifty-ninth Street Crosstown line between the Metropolitan Street Railway and the Central Park, North & East River Railroad for December, 1910, January, February, March and April, 1911. The summary of this table showed that during these five months the Metropolitan Street Railway carried 376,593 passengers who paid to it 4 1/2 cents per passenger under the joint rate, that the Metropolitan Street Railway carried 39,733 passengers who paid the additional 2-cent rate under the 10-cent joint rate, and that the Central Park, North & East River Railroad received 3 1/2 cents from 378,588 passengers who traveled on the joint rate across town.

Mr. Connette was recalled and said: "In Nashville, Syracuse and Worcester, where I managed street railway properties, we gave universal transfers at all intersecting points in the same general direction, and it was my opinion that it was profitable to do this because it encouraged and educated people to ride. All the lines in Nashville were consolidated and equipped with electricity. That, of course, had a tendency to increase traffic, but the receipts were abnormally high compared with what they had been previously when transfers were not issued. A central transfer station was established in Nashville and all cars radiated

from and passed through the station, and passengers were permitted to transfer there to any car they chose."

Mr. Mathewson said that in a matter of such importance it did not seem right to compel the companies to continue at this time of the year.

In reply Commissioner Eustis said: "We have had this question in mind for some time, but we hoped that the various reorganization schemes would be finished by now. We then expected to take up and adjust this transfer matter. You have heard this morning how this commission was taken to task for not doing anything under the amended law. We cannot sit here for three or four months and do nothing just because it is summer. I will adjourn this hearing until Monday, July 10, 1911, when we will have the whole commission here and you can then apply for a further adjournment."

At the hearing held on July 10, 1911, Chairman Willcox made the following statement:

"The commission has determined to adopt at its meeting on July 11, 1911, an order directing the street surface railroads in Manhattan Borough to establish, on or before Aug. 10, 1911, through routes and joint fares over the connecting and intersecting railway lines shown on Exhibit 1 at this hearing, and that transfers be given at all the points of intersection shown on said exhibit. In the meantime, this hearing will be adjourned to Aug. 15."

NEW YORK MEETING OF COMMITTEE ON WAY MATTERS

The committee on way matters of the American Electric Railway Engineering Association held a meeting at the New York office of the association July 6, 7 and 8. The following members of the committee were present: J. M. Larned, engineer of way, Pittsburgh Railways Company, chairman; C. B. Voynow, assistant engineer of way, Philadelphia Rapid Transit Company, vice-chairman; M. J. French, engineer maintenance of way, Utica & Mohawk Valley Railway; R. C. Cram, assistant engineer, Connecticut Company; C. S. Kimball, engineer maintenance of way, Washington Railway & Electric Company; B. E. Tilton, engineer maintenance of way, New York State Railways, Rochester Lines; C. L. Crabbs, engineer of way and structures, Brooklyn Rapid Transit Company.

The first subject taken up was the report of sub-committee No. 2, of which M. J. French is chairman, on "organization and rules for the proper government of the way department." The following definition of the way department was formulated and approved: "The way department is that division of the company organization having charge of right-of-way, tracks, bridges and all matters pertaining to their construction and maintenance and such other duties as may be assigned to it." It was decided to recommend the title "engineer of way" for the chief officer of the way department.

After a discussion on the details of organization a chart was prepared showing the principal employees of the way department, their titles and respective channels of communication. The remainder of the afternoon session on Thursday was devoted to a discussion of the proper form and scope for the code of rules for the government of way department employees, there having been two tentative sets submitted by the sub-committee, one for interurban lines and the other for city lines. It was decided that these should, if practicable, be combined into one code, and a revision of the two codes was thereupon undertaken by the committee as a whole, each rule receiving separate consideration.

At the session on Friday morning E. R. Mason, representing the Electric Service Supplies Company; F. J. Drake, representing the Lorain Steel Company, and G. S. Vickery, representing the Pennsylvania Steel Company, were present at the request of the committee to give the committee the

benefit of their views regarding the practicability of the proposed standard 9-in. grooved rail section which had been designed by a sub-committee of which Mr. Voynow is chairman.

Mr. Mason called the attention of the committee to the necessity for providing sufficient space under the joint plates for bonds of the proper size. His company recommended bonds having a conductivity of 10,000 circ. mils per pound of weight per yard of the rail section. Thus, a 125-lb. rail should have bonds with a section of 1,250,000 circ. mils.

Both Mr. Drake and Mr. Vickery objected to a vertical side on the head of the rail next to the groove. They thought that much more satisfactory results could be secured in rolling if the side of the head was made at an angle of from 3 deg. to 6 deg. from the vertical. They preferred a rail section with a 6-in. base, but assured the committee that rails with a 6½-in. base could be rolled provided the distribution of the metal in the head of the rail was nearly symmetrical. They also made a number of other suggestions relating to minor details of the section which had been designed by Mr. Voynow's committee. On Friday evening the committee on way matters, after carefully considering the criticisms offered by the manufacturers, gave definite instructions to the chairman of the sub-committee with reference to modifying the proposed design of grooved girder rail in accordance with the suggestions which had been made by the manufacturers on the ground of difficulty in rolling. The chairman of the sub-committee was instructed to revise the proposed section at an early date so that it could be submitted with the remainder of the report of the committee on way matters. The 9-in. rail section only was considered in this connection.

On Friday afternoon and on Saturday the committee continued the consideration of the code of rules, which it will present as part of its report to the convention.

BLOCK SIGNALS ON BEEBE SYNDICATE LINES

The Rochester, Syracuse & Eastern Railroad has recently put in service a 16-mile section of automatic block signals controlled by alternating-current track circuits on its line between Rochester and Macedon. The signal equipment includes eleven style B, 110-volt signals having separately suspended blades as manufactured by the Union Switch & Signal Company. The power for this signaling is obtained from the railroad company's substation at Macedon, where the voltage is stepped up from 360 volts to 2200 volts for transmission to the signals on No. 8 insulated copper line wires. At each signal location special transformers are installed having primaries wound for 2200 volts, and three secondaries, one wound to give 110 volts for the operation of the signals, motors, line relays, etc., and each of the other two wound to give a proper voltage for track circuits. The two track secondaries can be connected in series for the operation of extra-long track circuits.

The track circuits are of the double-rail type, both rails being available for the return propulsion current. Inductive bonds of 500 amp capacity are installed at the end of each track circuit for the accommodation of this return propulsion current. The majority of the track circuits are end fed, i. e., the current is fed into the track circuits at one end of the block, an impedance coil being installed between the transformer and track, the relay connections being made at the other end of the track circuit in the usual manner. The relays used for track circuits are of the galvanometer and vane types, the vane type relays being used on the short track circuits and the galvanometer relays on the long track circuits. The vane-type relays are used for all line circuits and are wound to operate on 110 volts.

The Syracuse, Lake Shore & Northern Railroad now has under installation an 8-mile section of automatic block

signals embodying six style B signals with track circuits and control arranged substantially as on the Rochester, Syracuse & Eastern Railroad.

Both of these installations were made by the Union Switch & Signal Company's forces under the direction of R. A. Dyer, mechanical engineer of the Inter-State Financing & Construction Company.

NEW WORK OF THE SOUTH SHORE SINGLE-PHASE LINE

The Chicago, Lake Shore & South Bend Railway, known as the "South Shore Route," operating a high-speed, 6600-volt, single-phase road from South Bend, Ind., through Michigan City and Gary to 103d Street, Chicago, has under way a number of interesting improvements which have been brought about largely by a rapid growth in traffic.

This company transmits power along its right-of-way at 33,000 volts single phase for railway operation, and at 6600 volts and 33,000 volts, three phase, for commercial use. A contract has just been closed for supplying from the railway generating station at Michigan City a daily twenty-hour load which will approximate 1,000,000 kw-hours per year. This energy will be delivered as 6600-volt, 60-cycle, three-phase current for local use and as 33,000-volt, 60-cycle, three-phase current for long-distance transmission.

The boiler and generating equipment at the Michigan City plant of the railway is being increased by the installation of a 3000-kw, three-phase, 60-cycle horizontal turbine, one 1000-kw motor-generator set and one 1000-kw step-up transformer with a ratio of 6600 to 33,000. The existing equipment included two 500-kw motor-generator sets installed last year and these, in combination with the new 1000-kw set, are used as frequency changers, converting single-phase, 25-cycle current into three-phase, 60-cycle, or the reverse, as the loading of the two different types of turbo-generators may require. The addition of a new step-up transformer gives the plant a capacity of 4000 kw in transformers. The new generating equipment will require the addition of 1000 hp in boiler capacity, which will shortly be purchased and installed.

LIGHTNING PROTECTION

The electrical department of this road has just received material for the erection of a ground wire to be carried above the tops of the transmission lines for the full length of the road. This will be for lightning protection. It will consist of a $\frac{3}{8}$ -in. steel cable grounded to 8-ft. lengths of galvanized pipe, driven into the earth. The connections to ground will be at every fourth pole, the poles being 166 ft. apart on tangents. The steel cable will be carried at a height of 4 ft. above the transmission wires and will be supported by heavy angle irons, fastened to the pole tops by two $\frac{3}{4}$ -in. bolts. The wire will be fastened to the angle irons by Crosby clips.

DOUBLE TRACKING

The South Shore route enters Chicago over 8.5 miles of double-tracked right-of-way owned jointly by the electric road and the Illinois Central Railroad. This portion of the line extends from the Illinois-Indiana state line to Pullman, the junction with the Illinois Central suburban service. Heretofore one track only has been used by the electric line, but a trolley wire is shortly to be strung over the second track, which originally was built for use by the Illinois Central Railroad. The installation of this trolley will give the South Shore route a high-speed double-track line from Pullman, Ill., to Gary, Ind., a distance of 24.5 miles, through the congested industrial district southeast of Chicago.

The new trolley construction is of particular interest because the catenary will support a steel contact wire. The design of the suspension of the messenger cable is similar to that followed in the original construction of the road. The messenger consists of a $\frac{5}{8}$ -in. seven-strand steel cable

supported by mast arms and in turn carrying a No. 0000 grooved copper trolley wire. Underneath this trolley wire on the new double-track work will be supported a No. 000 capacity hadd-drawn grooved steel contact wire. This steel wire will be hung 3 in. below the copper trolley wire and the hangers will be placed midway between the messenger hangers, thus providing the maximum elasticity.

C. N. Wilcoxon, general manager of this property, states that unless one is familiar with the practical conditions surrounding distribution of trolley current at 6600 volts he will be amazed at the results obtained. For example, the gravel pit of this road is three-quarters of a mile away from the main line and the trolley wire leading to the gravel pit is a seven-strand steel guy wire erected to obtain lowest cost and to avoid theft of copper. This single steel-cable trolley wire is not supplemented by any feeders, yet conducts ample power to permit handling eight loaded 80,000-lb. Rodger ballast cars out of the gravel pit and onto the main line. Similarly one of the electric locomotives of this company has handled forty-five empty 100,000-lb. capacity steel-bottom Rodger ballast cars with ease up a 1 per cent grade and also a train of twenty-four such cars fully loaded with ballast. The locomotives are equipped with four Westinghouse 125-hp a.c. motors.

NEW TERMINAL FACILITIES

At the junction of the South Shore route and the Illinois Central suburban service in Kensington, Ill., near the southern limits of the city of Chicago, a new interlocking plant is to be installed to permit the electric cars to cross the four main-line tracks of the Illinois Central and thus reach and use the platform of the Illinois Central steam suburban service at Pullman. This work will require the construction of about a mile of new electric track which will extend along the west side of the Illinois Central right-of-way and will terminate at the nine-acre property owned by the electric road between 103d and 111th Streets, Chicago, adjoining the Illinois Central right-of-way. This terminal will provide both freight and passenger facilities and when trains enter it terminal passengers will not be required to pass over the foot bridge from one side of the Illinois Central's right-of-way to the other as at present.

NEW TIMETABLE OF THE ALBANY SOUTHERN RAILROAD

On Sunday, June 25, the Albany Southern Railroad, Albany, N. Y., put into effect its summer timetable No. 10. The new working timetable for the use of employees has been issued in a novel form. Heretofore the working timetables of this road, in accordance with the practice of most interurban electric railways, were printed on the inside pages of a four-page folder, measuring 12 in. by 36 in. The new working timetable is designed to be much more convenient. It is in book form and measures $4\frac{1}{8}$ in. x $6\frac{3}{4}$ in. The list of stations and the distances are printed on a left-hand page, which when unfolded extends out beyond the cover and the other pages of the book. In this way one list of stations can be used to refer to the columns of train times shown on any of the following eight pages. Each page of the working timetable contains ten columns, each $\frac{5}{16}$ in. wide. Four pages are used for showing the times of thirty-five first-class trains and one second-class south-bound train and the next four pages are used for an equal number of north-bound trains. Sufficient space is left at the top for the name of the railroad company, the direction of the train movement, the number of the timetable and the class of the trains shown. At the bottom of each page is printed a brief instruction to motormen or conductors relating particularly to the prevention of accidents.

In addition to the working timetable the pamphlet contains sixteen pages of special instructions, extracts from the rule book of the company, instructions on the prevention of accidents, and a list of physicians and hospitals in the

different towns reached. This printed matter in the timetable is not intended in any sense to take the place of the standard rule book of the company. Considerable information, however, has been included which is usually contained in special notices which are issued from time to time, and which would not appear in the standard rule book. The files of special notices on the bulletin boards in the car-houses have been removed and all of the instructions in force have been incorporated in the working timetable. The company believes that it is practically impossible to get all the motormen and conductors to study a large file of old special notices frequently enough to keep the instructions contained therein fresh in their minds.

It is not believed that the cost of future issues of this timetable will exceed the cost of the old form of timetable formerly used.

GASOLINE WEED BURNER

The accompanying illustration shows the Lamb weed burner for destroying weeds on railway right-of-way. These burners are in service on a number of electric railways in Illinois and California and are said to have proved very efficient. The Lamb weed burner is constructed entirely of metal and is mounted on a standard

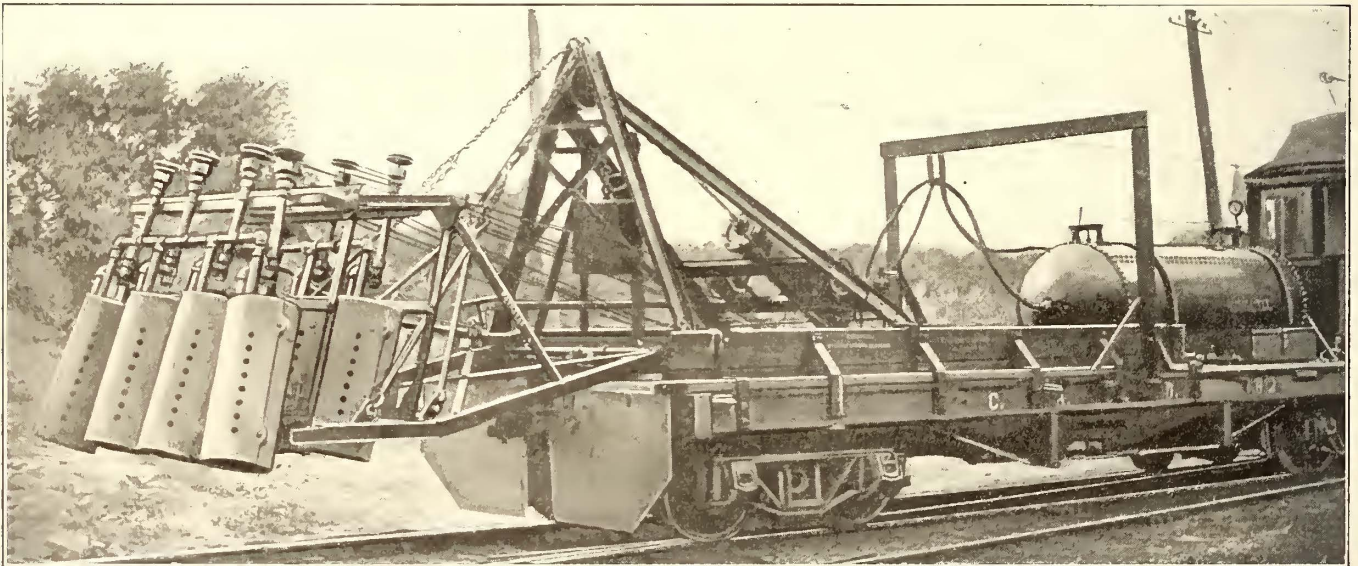
raise or lower the burners or move the steel frame to any desired position. This flexibility in the apparatus overcomes the serious objections found in other types of weed burners and eliminates the possibility of burning ties, wooden bridges, crossing planks and other wood material ordinarily used in track construction.

The burners are normally set for burning the vegetation between the rails and for a distance of 30 in. on either side, but their position may be changed so as to cover a greater area outside of the rails.

Under ordinary conditions it is claimed this weed burner will effectively destroy all vegetation while the car on which it is mounted is run at a speed of from 6 to 12 m.p.h. The speed at which the car is propelled is regulated according to the age and quantity of the vegetation to be destroyed.

INSTRUMENT FOR TESTING FIELDS

A novel field testing device is in use in the shops of the Western New York & Pennsylvania Traction Company at Olean, N. Y. It consists of a slotted wooden case, in which are mounted a spiral spring and an iron plunger with an enlarged base. The amount of compression of the spiral springs is indicated by a pointer, in the same manner as on



Gasoline Weed Burner

flat car. The framework is made up of steel angle bars and is supported on a metal carriage which is mounted on small wheels. It is so constructed that the burners may be raised and lowered or shifted forward and backward on the car at will. These movements are controlled by air cylinders which are connected up with the train air-brake line. The manufacturers are Wheelock & Buchanan, Aurora, Ill.

As shown in the illustration, there are seven self-generating burners of the Bunsen type, mounted side by side. These burners are 14 in. in diameter and 30 in. long, and they are so made that the heat does not injure the metal. On the inside at the upper end of these burners the supply pipes are coiled in such a way as to provide ample generating surface. These pipes are carried direct from the generators to a 1200-gal. gasoline tank which is located at the rear end of the car. The flow of gasoline is regulated by means of safety and automatic emergency valves. The flow of gas to each burner is separately controlled by the aid of cables which lead from the burners to a point back of the steel carriage where the operator is located. From this point the operator is able to regulate the intensity of the heat, control the flow of gasoline,

an ordinary spring balance. In the upper end of the wooden case a common compass is inserted and covered with glass. To detect a wrongly connected or short-circuited field coil the following procedure is used: If a single coil is defective for any reason in any way the magnetism due to the current flowing through that coil will be weaker than that produced by the other coils in series with it. As this effect extends to the leakage magnetism existing behind the poles of every excited machine the test may be applied around the outside of the motor from pole to pole while a current is sent through the motor. The pull on the iron plunger behind a pole surrounded by a defective coil will be much less than that behind the others. Having located a weak pole, the compass is used to detect whether the weakness is due to a wrong connection or to some short-circuit condition.

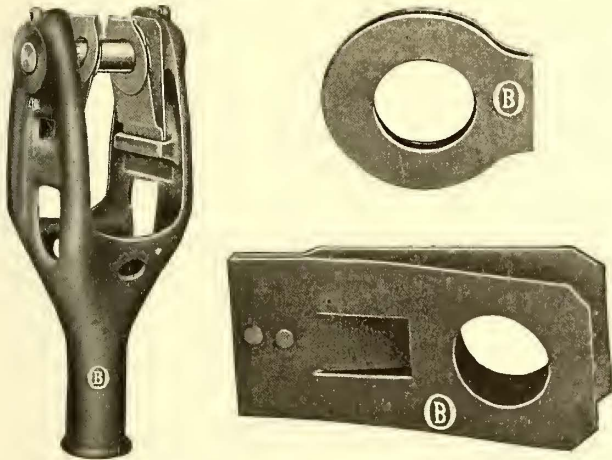
During 1910 the tramway company of Cairo, Egypt, extended its system along different lines branching in all quarters of the capital, their total length now amounting to 139 miles. The company carried 53,492,219 passengers in 1910, an increase of 4,000,000 over the previous year. The receipts amounted to \$1,384,330 in 1910.

TROLLEY HARP AND ALIGNING EAR

TURBO-GENERATOR VENTILATING DEVICE

The Ohio Brass Company, of Mansfield, Ohio, is listing a new design of trolley harp for which several commendable features are claimed.

The harps are so designed as to eliminate all sharp corners or projections which would be liable to catch in the trolley wires. Great strength has been obtained with light weight. The body casting is made of malleable iron and is provided with a rope hole on each side so that it may be reversed when one side is worn.

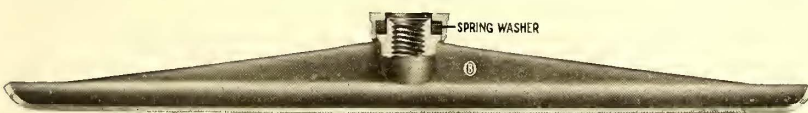


Trolley Harp, Contact Spring and Washer

The contact springs are made of phosphor bronze and are held in place without the use of any rivets or other fastening devices so that they may be easily and quickly renewed when worn. They are provided with reversible wearing washers which may be worn on both sides before renewal is necessary.

The company has also brought out a new type of trolley ear which can be tightened upon a round top hanger and brought into alignment with the trolley wire without the necessity of backing off. A tight joint is always maintained between the top of the ear boss and the insulation of the hanger and eliminates danger of the threads stripping in service.

The ear is simple in construction, entirely self-contained and positive in its action. It consists of a cap rolled in place on the boss and a positive lock washer interposed between the cap and a shoulder on the boss. There is



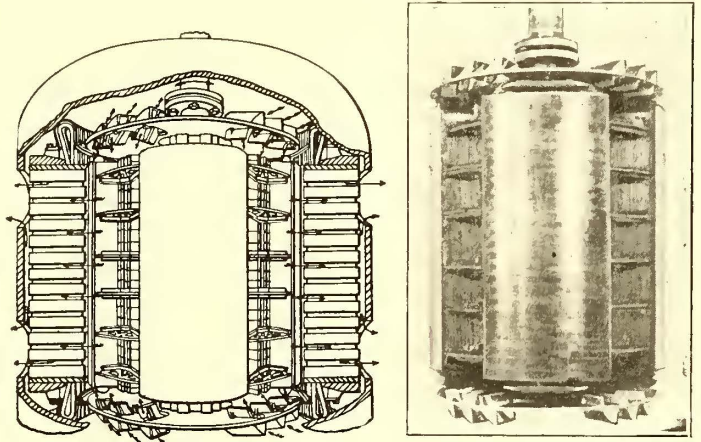
Aligning Ear

sufficient compression to the lock washer to permit the ear being turned one complete revolution after the top of the boss first comes in contact with the insulation of the hanger.

The ear is made in 15-in. length with a 5/8-in. boss, and in two sizes for No. 00 and No. 0000 round wire.

According to a report from Max J. Baehr, United States Consul, Cienfuegos, Cuba, the Cienfuegos, Palmira & Cruces Electric Railway & Power Company is proceeding with its enterprise, and the government has conceded it a subsidy for 60 miles of road at the rate of \$8,400 per mile. There is also a bill before the Cuban Senate to allow this company to import all material necessary for the construction and operation of its proposed line within the Province of Santa Clara duty free. This would mean a considerable saving to the company on the 350 miles of railway. The bill has passed the House of Representatives and will pass the Senate.

During the past year Charles E. Baker, consulting engineer and formerly superintendent of motive power and machinery Boston Elevated Railway, has been assisting C. E. Bancroft, superintendent of motive power and machinery Boston & Northern and Old Colony Street Railways, in remodeling and making numerous changes in some of the power houses of those companies. At the Quincy Point



Sectional View of Generator, Showing Path of Air Currents Buckets Applied to Top and Bottom of Rotor

power station, which contains five 2000-kw Curtis turbo-generators and ten 650-hp boilers, some interesting experiments have been made to determine the efficiency of air-cooling the generators by means of a large detached motor-driven blower and also a compound pressure blower designed by Mr. Baker, which is attached directly on the shaft of the generator. After testing both methods of ventilation it was found that the blower designed by Mr. Baker was much more efficient than the detached blower and was noiseless and invisible. It does not require large air ducts to be connected to each end of the generator, which would occupy a large amount of space and spoil the appearance of the engine room, and it can be applied at comparatively small cost.

The tests showed that with this device it was possible to increase the capacity of the generators 50 per cent above their normal rating without undue heating, and it was found possible also to increase the steaming capacity of the boilers correspondingly by making a few minor changes. The device has been applied to four of the five generators in the Quincy Point station and the capacity of the station has been increased thereby from 10,000 kw to 15,000 kw. As the increased capacity has been obtained with practically no additional cost for labor, maintenance and depreciation and with only a small capital expenditure, the cost of the additional power is only the cost of the additional fuel burned under the boilers.

The device consists of a steel plate disk rigidly fastened at each end of the rotor and a series of curved buckets on each disk for entraining and forcing the air through the disk into the spaces between the field poles on the rotor. The inside retaining ring on the stator forms a seal with the edge of the disk on the rotor shaft so that air is drawn in at each end of the rotor through the buckets on the disks and is forced through the vertical spaces between the pole pieces of the rotor from both the top and bottom. The air then passes across the air gap, through the horizontal ventilating passages in the stator and out into the room through the holes in the outer casing. If desired, the casing can be inclosed with an air duct to lead the hot air to the outside of the building, or to the boiler room. The intake

air also can be drawn through a duct from outside the building if the air in the engine room is too dirty or carries much oil in suspension.

While no tests have been made at Quincy Point to determine the actual volume and pressure of the air forced through the generators with this attachment, some idea of its capacity and efficiency in distributing the air throughout all parts of the generators can be gained by comparing the performance of a generator ventilated with a detached fan blower. A 100-in. steam-driven Sturtevant blower was attached to both ends of one of the 2000-kw machines and run at sufficient speed to produce a pressure represented by $2\frac{1}{2}$ in. of water. The air was drawn from outside the building. Under these conditions the generator carried a load of 3000 kw for four hours with a rise in temperature above the surrounding air of 55 deg. C. With the Baker attachment on the rotor and drawing air from the room the generator carried a load of 3000 kw with a temperature rise of only 38 deg. C., which was 6 deg. less than the temperature at the normal rating of 2000 kw before any changes were made.

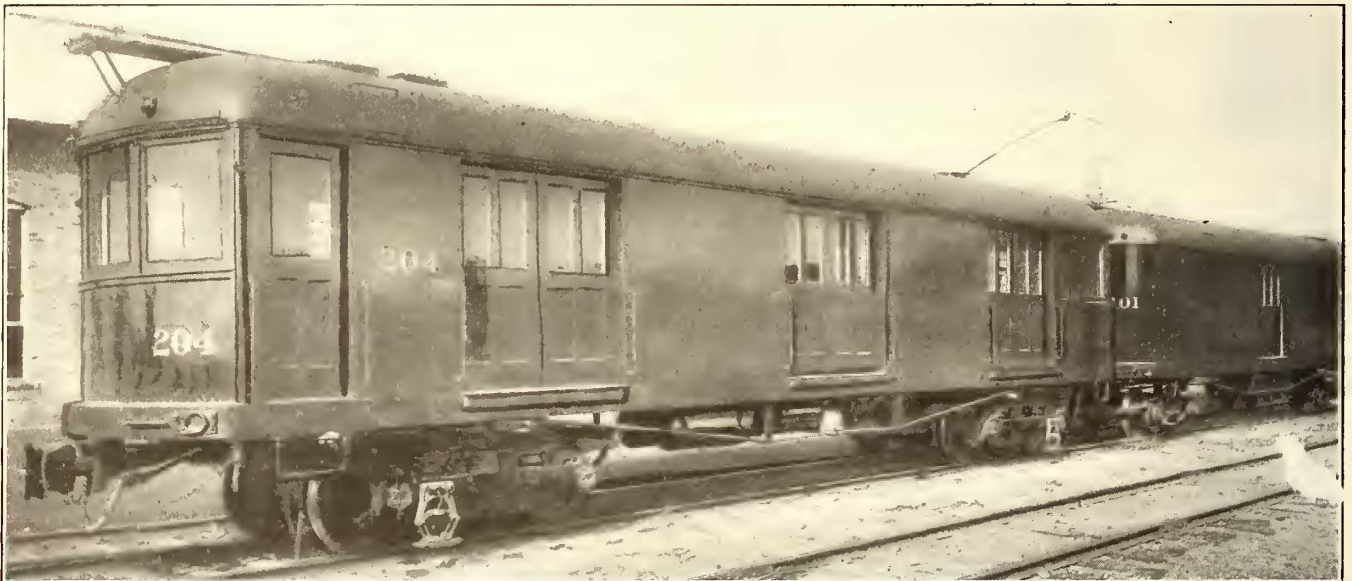
This type of ventilating device can be applied to many of the existing types of turbo-generators at small cost. A

NEW FREIGHT CARS OF MICHIGAN UNITED RAILWAYS

The Michigan United Railways Company, Jackson, Mich., has recently added to its equipment eight large arch roof express-freight cars for use on its third-rail and trolley divisions. The express and freight business of this road is growing rapidly as the result of extended territory and intensive solicitation. Five of the new cars are equipped with motors and three are trail cars. One of the motor cars, with trailer attached, is illustrated.

The car bodies and trucks were built by the McGuire-Cummings Manufacturing Company at Paris, Ill., and were equipped at the Albion shops of the railway company. The following dimensions apply to the motor cars: Length over the bumpers, 50 ft.; length over all, 52 ft. 6 in.; distance between the truck centers, 31 ft.; width over the sheathing, 8 ft. 11 in.; height from rail to trolley base, 13 ft. $7\frac{1}{2}$ in.; capacity, 80,000 lb., 2,325 cu. ft. The motor cars are mounted on No. 20-A trucks, with 37-in. Midvale steel wheels. The axles have 5 in. x 9 in. journals and Symington journal boxes.

The principal dimensions of the trail cars are as follows: Length over the bumpers, 41 ft. 5 in.; length over all, 43



New Express-Freight Car of Michigan United Railways

patent covering the application of the device to generators and also to compound-pressure blowers has been granted to Mr. Baker, who is perfecting plans for their manufacture and installation on generators now in use which have been built with the old style of rating, providing for a momentary overload capacity of 100 per cent. The only reason that these generators cannot carry an average or commercial load of 50 per cent or more in excess of their normal rating for any considerable length of time is their rise in temperature to the destructive point of insulation, etc., because the steam end is amply large for a 75 per cent increase output above normal. It is also a fact that generators operated with a low power factor will show greater rise in temperature per kilowatt output than those with a high power factor, and it is often found that they cannot be operated with safety at over 75 or 80 per cent of normal rating in kilowatt output.

Work has been begun on the rebuilding of the Graham Building, owned by John R. Graham, president and general manager of the Bangor Railway & Electric Company, a business block in the heart of the city, which was destroyed in the fire on April 30. This will be six stories of buff brick, and will be leased largely for headquarters offices for the Bangor & Aroostook Railroad.

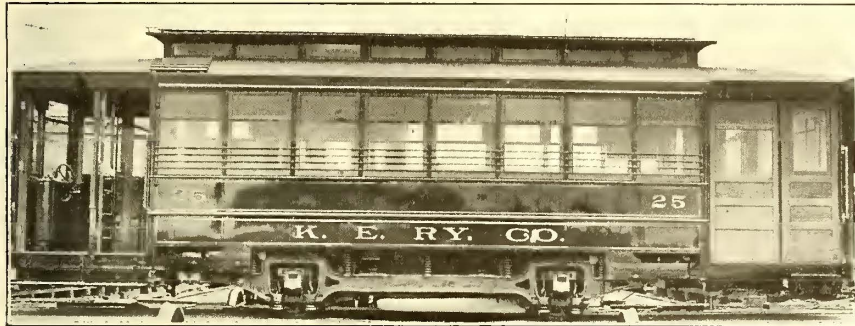
ft. 11 in.; distance between the truck centers, 28 ft. 6 in.; width over the sheathing, 8 ft. 11 in.; capacity, 60,000 lb., 2000 cu. ft. The trail cars have Wolf cast-steel trucks and $4\frac{1}{4}$ -in. x 8-in. journal axles.

The motors are GE-214, rated at 75 hp each. The electric equipment also includes K-34-D controllers, U. S. 13 trolley bases and G. E. luminous arc headlights. No. 2 Knutson trolley retrievers are used. The air-brake equipment was supplied by the General Electric Company. It is designed for operation on electric and steam roads. Two motorman's valves are employed, straight air being used when cars are operated singly, the automatic when operated in trains. The compressor is of the C.P.-23 type and has a capacity of 24 cu. ft. of free air per minute.

Both motor and trail cars are equipped with automatic couplers of the radial type which are designed to couple on a 35-ft. radius curve. The motor cars have three door openings on each side, 6 ft. x 6 ft., and one swinging door at each end for the use of the train crew. The trail cars are provided with one door on each side, 6 ft. x 6 ft., and a door at each end for convenience in loading and unloading long materials. Two electric signal lights are provided at each end of the cars and they are also equipped with standard marker and flag brackets, and have projecting running board along the roofs for the use of the crews.

NON-PARALLEL AXLE TRUCK CARS FOR KANKAKEE, ILL.

The Kankakee (Ill.) Electric Railway has recently received from the St. Louis Car Company two vestibuled single-truck prepayment cars of the design shown in the accompanying cut. The most interesting feature is the use of Warner 10-ft. wheel base non-parallel axle trucks. The general dimensions of these cars follow: Length of car body over the corner posts, 21 ft.; length of car over the buffers, 34 ft.; length of the car platforms, 6 ft. 6 in.; width over the panels and sills, 8 ft. 2 in.; height from underside of sill to the top of trolley board, 9 ft. 3 in. The general design



Car with Non-Parallel Axle Truck

calls for eight windows on each side fitted with a stationary top sash and a lower sash which drops into a flap-covered pocket. The cars are for double-end operation. One side of the vestibule has a single exit sliding door and folding step which are operated together by the motorman; the conductor's side has double folding doors. The long step opposite these doors is hooked up when not in use. Both types of steps have Mason treads.

The bottom framing consists of two 3 3/4-in. x 5-in. and 1 3/4-in. x 5-in. yellow pine sills with 12-in. x 3/8-in. steel plates sandwiched between and bolted together. Two sub sills, one on each side of the car, are gained into and bolted to all cross-bars. The end sills and cross-bars are of white oak. The two end cross-bars that support the platform knees are reinforced with iron plates 6 in. x 3/8 in. Both platforms are 6 ft. 6 in. long. The center platform knees are 2 3/4-in. x 5-in. oak, while the side platform knees are 2 3/4-in. x 7 3/4-in. oak reinforced by bolted 6-in. x 1/2-in. plates. The buffers are 6-in. x 1/2-in. plates with an oak crown piece and cast-iron buffer shield. The body framing is of ash and yellow pine, but the side panels are of sheet steel. The boards of the monitor-type roof are of poplar, which is covered with No. 8 canvas laid in white lead and given three coats of roof paint. The rafters are of ash strengthened with steel carlines.

The inside finish, including the doors, sash and moldings, is of mahogany. No. 16 sheet steel, painted and grained mahogany, is used for the side lining below the window rail. The lower and upper ceilings are of three-ply birch veneer. All metal trimmings inside the car are of polished and lacquered solid bronze. Bronze is used also for the grab-handle brackets at each step opening, for the end window and vestibule door sash guards. The seats are of rattan. They consist of six reversible cross seats on each side of a 24-in. aisle and four longitudinal seats in the corners. Pantasote curtain material is used for the curtains and double sliding body end door. The curtains have Forsyth ring fixtures.

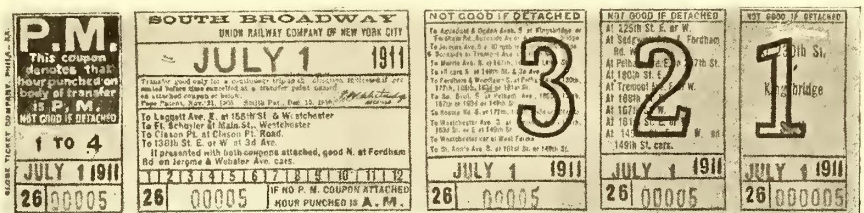
The cars are equipped with the builders' drawbars, sand-boxes, dash headlights and illuminated signs. A dry battery push-button system is provided in connection with

the prepayment system of fare collection. The hand-brake equipment consists of the car builders' vertical wheel brake with staff and Peacock gears.

MULTIPLE COUPON TRANSFER USED IN NEW YORK

The Union Railway Company, which operates in the borough of the Bronx, New York City, placed in operation on July 1 a new transfer system, whereby a single ticket gives the user the privilege of securing the maximum ride in the same general direction without asking for a second transfer slip. This is obtained by making the tickets with as many extra stubs as could possibly be used for riding in the same general direction to a given point. An additional stub is employed for p. m. use. The transfer ticket reproduced shows that the holder can have four distinct transfers as follows after the first ride on a cash fare:

The first transfer in this case is at 230th Street traveling south on the Kingsbridge line. Stub No. 1 is an emergency transfer because this line is now divided by a steam railroad crossing at grade over which electric cars are not permitted to run. Stub No. 2 is good for traveling crosstown east or west, but when the passenger uses stub No. 3 he can travel south only in accordance with the original direction. Stub No. 4 is good for east or west crosstown riding in accordance with the statement on the transfer, but one exception is made in favor of northerly riding if the passenger reaches the point named on the ticket with two coupons still unused. The p. m. stub is on the left-hand of the complete transfer and therefore remains on the last transfer used. The p. m. coupon is torn off by the conductor if the transfer is issued during a. m. hours. Only the last transfer slip is provided with an hour indication, which serves for all. The printed instructions on the transfers



Multiple Coupon Transfer

show the permissible transfer routes and directions, but a color scheme is used for the convenience of the conductors. Thus, north is green, south is rose, and crosstown is white, except where crosstown lines converge to the same point like the sides of an angle. In the last instance the east crosstown line tickets are gold, and the west crosstown lines are blue. The multiple coupon transfer was introduced to prevent continuous riding on the Union Railway System where the peculiar routing of the lines necessitates the use of several transfers by most riders. These transfers are 8 in. long and 2 in. wide.

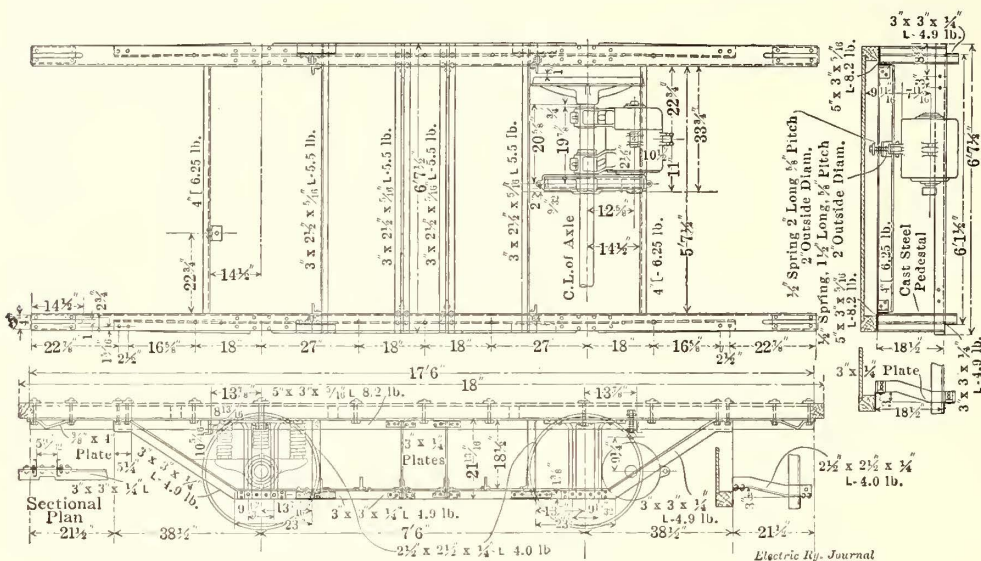
F. A. Lipsi and A. W. Below propose to organize a company to construct and operate an electric railway from Moscow, Russia, to the Ssergievski Possad, with branches to the Northern Railway. The lines would be about 46 miles long, and the cost of construction is estimated at \$4,575,000. The project has been submitted by the Ministries of Finance and Ways of Communication to the Council of Ministers.

MORE STORAGE BATTERY CARS FOR THE THIRD AVENUE RAILROAD, NEW YORK CITY

Early in 1910 the Third Avenue Railroad, New York, began to operate storage battery cars over some of the lines previously served by horse cars. The first cars, which were five in number, proved so successful that twenty-five

efficiency of this gearing was practically the same as that of a chain in good working order. The gears will practically eliminate all maintenance trouble due to the driving mechanism and will take up less space. All the gears to be installed will be of high-grade steel.

The accompanying drawing of the new truck and motor suspension gives the principal dimensions and shows the



Plan and Side Elevation of Truck for Third Avenue Railroad Storage Battery Cars

sizes of the framing members. The truck will be built up of commercial shapes throughout to insure ease in maintenance. It is to be furnished with Lobdell cast-steel wheels and the Railway Roller Bearing Company's anti-friction journal bearings. The principal dimensions of the new cars will be as follows: Length over the vestibules, 26 ft. 1½ in.; length of the body, 18 ft.; width over all, 7 ft. 6 in.; width over the sills, 6 ft. 5½ in.; height from the rail to the sills, 2 ft. 5½ in.; height from the sills to the roof, 8 ft. 2½ in. The longitudinal seats will be for thirty passengers. The general construction of the car will be of wood, with white ash interior trim and Agasote head linings. Among the specialties to be placed on

more were installed before the end of the year and now an order has been placed with The J. G. Brill Company for another thirty-five cars. The new cars will not vary in any important respect from the previous storage battery rolling stock, except that the truck will be designed to permit the batteries to be placed under the body if necessary and that standard railway motor gearing will be used instead of chain drive. Each of the new cars will be equipped by the Electric Storage Battery Company with "Hycap-Exide" batteries, each equipment having a rating of 420 amp-hours. The manufacturer has agreed to maintain the batteries for five years, during which period the output must not fall below 75 per cent of the original rating. All battery maintenance and replacements are handled by the manufacturer on a cents-per-car-mile basis.

these cars are Columbia sanders, Shroyer curtain fixtures and Pantasote curtain material.

A NEW MATERIAL FOR CAR HEADLINING

The Gardner Artificial Lumber Company, Barberton, Ohio, has recently entered the electric railway field with a new composition material suitable for the headlining and interior finish of cars. The material is being sold under the trade name "Galco." It is made in sheets of any desired thickness and in sizes up to 16 ft. long and 72 in. wide. The material has insulating qualities against heat and cold, which, it is claimed, are greater than any other material of a similar nature, and it is impervious to oil or water. By heating it to approximately 200 deg. it may be bent or pressed into any desired shape without cracking the surface and after being allowed to cool for ten minutes it will retain its shape indefinitely. It becomes harder with age, and as it has a perfectly smooth surface it takes a fine finish when used for headlining. The company has installed machinery for making this material which has a capacity of 10,000 sq. ft. per day of any thickness so that immediate shipments can be made at all times. The Marflo Railway Appliance Company, Cleveland, Ohio, is the general sales agent for the material, and the United States Metal & Manufacturing Company, New York, is general Eastern agent.

As an instance of the excellent service given by the Gould storage batteries in use on the first thirty cars it may be stated that one car, after making over 12,000 miles in commercial service, ran 114.08 miles on a single charge. The actual discharge of the battery was 492 amp-hours, which was equivalent to an overload of 72 amp-hours, or 16 2/3 per cent. The statistics of charging station output show that the average power consumption of all the storage battery cars now in service is about 500 watts per car mile, which is equivalent to 70 watts per ton mile when all losses are included.

It is estimated that the purchase of the Tokio (Japan) Tramways will cost about \$50,000,000, and that the placing of a foreign loan for that amount will be necessary.

The motor equipment per car will consist of two 4½-hp GE-1022 automobile type motors, similar to the original outfits, except that they will be furnished with axle bearings owing to the adoption of gearing in place of chains. The chains will also be removed from the old cars. In order to make this alteration the original motors will have to be furnished with axle bearings. The bearings will be bolted and then welded to the frame of the motor, after which the armature bearings will be lined up in a boring mill to make them absolutely parallel to the motor bearings. The decision to substitute the gears for a chain was caused by trouble from chain breakage. It was found that after some wear of the sprocket the chain did not mesh for proper riding and the individual links wore very rapidly. As an experiment, one car was equipped with gearing and runs were made with it for about 6000 miles. It was found that the

The *Electrical Review*, London, has published as a special supplement to the issue of June 30, 1911, a list of the electric tramways, tube railways and electrified steam railways in Great Britain. The supplement gives the names of the companies, the names of the manager and electrical engineer, the route mileage, number of cars, equipment of power stations, amount of capital invested, car mileage and number of passengers carried. Included are 191 tramway companies and fourteen tube railways and electrified steam railways.

News of Electric Railways

Chicago Subway Progress

The municipal law department of the city of Chicago has transmitted to the Chicago City Council an opinion stating that the city can build its own subway system, using for the purpose to secure a bond issue the fund which is being accumulated from the percentage of earnings of the surface railways which the city now receives. Some of the other conclusions of the committee follow:

"The city has the right to construct a system of subways by day labor if the statute passed by the last General Assembly is a valid one. In the absence of such legislation the city would not have the right so to do.

"The city has the right to construct a system of subways by contract for local transportation of passengers.

"The city has no right to construct or own a system of subways for the transportation of merchandise.

"The city has the right to provide for underground municipal utilities owned by the city.

"The city, in the construction of the system of subways, is not limited to its present needs, but may provide for its future growth.

"The city may allow utilities owned by individuals and private or quasi-public corporations to use a portion of the space in the subway, provided such use does not in any way interfere with the primary object of street railway transportation. The expense, however, of reconstruction and readjustment of such utilities must be borne by such individuals or corporations.

"The city has no power to operate a street railway in the system of subways without a popular vote approving of the proposition. The question was submitted to the people and was defeated.

"The city has the power to lease the system of subways constructed by it to railways incorporated under the laws of the State for the purpose of operating street railways for a term not exceeding twenty years.

"The city has the power to issue bonds for the construction and equipment of subways, provided said bonds are a lien upon such property and income only, and are not included in the bonded debt of the city.

"The city has the right exclusively to pledge and pay the traction fund as interest upon such bond issue and to use any portion of such fund for the purpose of funding such bonds.

"The city has the right further to use any net revenue received, either from the operation or the leasing of such subways when constructed, for the purpose of retiring such bonds.

"The city has the power to pay out of such bond issue the cost of reconstruction or replacement of underground municipal utilities owned by itself which may be disturbed by the building of the subways.

"The city has no power to pay out of such bond issue the cost of reconstruction or replacement of underground municipal utilities owned by individuals and private or quasi-public corporations which may be disturbed by the building of the subways."

City officials report that \$12,700,385 in bonds would be available for immediate use in subway construction if the voters should approve such an issue.

Shirlaw D. Gookins, secretary of the Chicago Subway Arcade & Traction Company, recently presented a comprehensive plan for a passenger subway system, an outer harbor and a boulevard link between the North and South Sides, including a bridge over the Chicago River, at the public hearing of the Chicago City Council local transportation committee. Complete construction, according to Mr. Gookins' plans, would cost about \$96,000,000. The plan provided for a subway system 59 miles in length under the principal thoroughfares. The cost of this portion of the work would be about \$72,000,000. The construction of an outer harbor was incorporated in the plan because the dirt removed for subway excavation could be used in building the harbor. The subway system would provide a number of loops and terminal points in the downtown district and a

number of through routes between the different sides of the city, as well as a terminal in Grant Park on the lake front.

J. W. Pearl, a former member of the Chicago city engineer's staff, appeared before the committee on local transportation of the Chicago City Council on July 5 to explain his plans for combined routes or interlocking subways for the city of Chicago. The scheme outlined by Mr. Pearl contemplates the construction of a number of intermeshed loops in the downtown district, north side tracks sharing the island platforms with west side tracks, and other west side tracks sharing island platforms with south side tracks, so that transfers across town are made easily. Through north and southbound traffic would be handled by a straightaway subway on State Street. Mr. Pearl also proposed loops for reaching the west side stations and underground arcades for the downtown stations, either of which, however, could be served by moving platforms if desired. As proposed, the plan would require 13 $\frac{3}{4}$ miles of tunnels, which, the designer estimates, could be built at a cost of \$15,000,000, the tunnels being driven by air pressure.

Transit Negotiations in New York

On July 12, 1911, the Board of Estimate and Apportionment of New York extended until July 15, 1911, the time given to the Interborough Rapid Transit Company to submit a new offer to the city in regard to constructing any of the rapid transit routes recommended to be divided between that company and the Brooklyn Rapid Transit Company in the report of the joint committee of the Board of Estimate and the Public Service Commission. Beginning July 10 the Board of Estimate proposed to hold daily sessions until the subway matter is adjusted. On July 10 President Shonts, of the Interborough Rapid Transit Company; E. J. Berwind, a director of the company; Edward M. Grout, of counsel for the company; Seth Low, chairman of the joint committees of the Chamber of Commerce and the Merchants' Association; H. P. Davidson and J. P. Morgan, Jr., of J. P. Morgan & Company, and E. F. C. Gaynor, auditor of the company, conferred with Mr. McAneny, the chairman of the joint committee of the Board of Estimate and the Public Service Commission, and members of the commission.

On July 12, 1911, it was stated that the Interborough Rapid Transit Company desired to be guaranteed a return of 8 per cent or 9 per cent, or between \$10,000,000 and \$11,250,000, on its present estimated subway investment of \$125,000,000 as a condition of accepting the lines apportioned to it in the joint report of the Board of Estimate and the Public Service Commission, the company to receive the deficit from the city or to be allowed to issue bonds to make the deficit good if the earnings on the new subway and its present subway system should be insufficient to realize the amount mentioned. On this proposal the Board of Estimate and Apportionment is said to be divided. Mayor Gaynor, President Mitchel and Controller Prendergast have declared that they would oppose any arrangement to have the city guarantee a return on the stock of the company. On this point Mayor Gaynor issued a statement on July 13, in which he said that he was not only opposed to the principle of any such subsidy, but he doubted its legality in view of the provisions in the constitution of the State forbidding any municipal corporation to "loan its money or credit to or in aid of any individual, association or corporation." He thought that it would be a serious question whether the city would not violate this provision if it put its money to the free use of a railroad corporation until the latter had earned 10 per cent or 6 per cent or any other profit on its capital. In the same way he said he was opposed to making an agreement with the Brooklyn elevated company that it retain 6 per cent or any other per cent on its present capital before the city is paid interest on its corporate stock.

Seth Low, chairman of the joint committee of the Chamber of Commerce and the Merchants' Association, sent to the Board of Estimate on July 12, 1911, a letter urging

prompt and favorable action in the subway matter in which he said in part:

"I am under the impression that an agreement can be made with the Interborough Company substantially on the following terms: That the Interborough Company shall agree to furnish \$75,000,000 of new capital, more or less, for the construction and equipment of that part of the McAneny plan assigned to it, if the city in any way that may be found legal will permit it to earn 3 per cent above interest and amortization charges on its old and new private capital. I think that it is of the utmost consequence to the city to carry out in its entirety the programme of construction outlined in the McAneny report. Without the co-operation of the Interborough Company, as well as of the Brooklyn Rapid Transit Company, this is impracticable. The great defect of the original rapid transit contract was in its failure to provide a method by which additions to the system could be made from time to time as desired by the city. The arrangement now proposed with both the rapid transit companies contains such a provision, so that by this agreement with the Interborough Rapid Transit Company the city will not only get the immediate result at which it aims but also it will avoid all danger of the cessation of rapid transit development in the future.

"The proposed arrangement with the Interborough Company will give to the city complete control of the entire system at the end of forty-nine years from the completion of the proposed extensions. It is true that in shortening the time by thus 'leveling the leases,' as it is called, the city agrees that the Interborough Company may enjoy both leases on existing terms up to the time when they are surrendered to the city—that is to say, in about fifty-four years from now. No doubt the advantage to the company under this arrangement is considered by it a fair offset to its concession to the city, but it is a very great advantage to the city to shorten by fourteen years the period during which these roads remain outside of its control. By entering into the proposed relations with both the rapid transit companies the city becomes absolute master of the rapid transit system of the city and its development.

"If any one questions the arrangement it will be upon the ground that the allowance to the Interborough Company is too large. Under the arrangement suggested that allowance is to be 3 per cent above interest and amortization charges on the total amount of private capital involved in the enterprise represented by bonds, which it is estimated will be about \$125,000,000; that is to say, the Interborough company will receive \$3,750,000 a year in excess of its interest and amortization charges. I do not hesitate to say that I think the terms agreed upon are fair, and it is altogether in the city's interest to have agreed to them. The Interborough's present stock capital is \$35,000,000, and its investment in the subway, covered by bonds, is about \$48,000,000 above this capital. Upon this stock last year it earned over \$4,000,000 after providing for the amortization on its bonds.

"Under the agreement proposed the Interborough Company will furnish \$75,000,000 of new capital for construction and operation; will put in at \$3,000,000 the Steinway tunnel, which cost it \$8,000,000, and it will receive for operating the enlarged system \$3,750,000 a year instead of \$4,000,000, which it is earning to-day for operating the smaller system.

"If it be assumed that the company's working capital will remain at \$35,000,000, as it is to-day, notwithstanding the enlarged system to be operated, the allowance to the company upon its capital is about 10¾ per cent. The public must bear in mind that this is the entire reward which the company will receive for operating this great system during the term of the lease, for the company does not own the subway, and all of the increased value of the subway passes to the city automatically when the lease expires.

"There are many who regret that the original leases run for so long a term; but it is easy to be wise after the fact. At the time, the opinion was general, not to say universal, that the city had been most fortunate in being able to conclude such leases. Probably everybody will be glad that, through this arrangement, the leases would fall into the city fourteen or fifteen years earlier than otherwise; but this result is obtainable only by agreement with the Interborough Company and no agreement can be made at the present time on better terms than are herein suggested."

Special Message on Taxation in New York

Governor Dix of New York sent his third message on taxation to the Legislature on July 12, 1911. He calls the attention of the houses to two bills already introduced and recommends their passage. One of the bills concerns taxation of special franchises and the other provides for a simpler method of taxing corporation franchises. The Governor says that laws on both subjects ever since they were passed have been fruitful of litigation, and that while the law covering taxation of special franchises has been interpreted by the courts so that in most particulars it is intelligible and serves its purpose, in one point the law is so phrased as to throw unnecessary and constant work upon the courts. This concerns the equalizing of special franchise valuations to the same percentage of full value as that given to ordinary real estate by local assessors in making out their tax rolls. The courts have decided, says the Governor, that such equalization is right, but in practice it has become necessary for owners of special franchises to get out writs of certiorari before the lower valuation is entered on the tax rolls.

The Governor recommends that the State Board of Tax Commissioners be empowered to equalize these assessments before certification to the local authorities. He says that Assembly Bill 1835, framed in accordance with recommendations of taxing authorities, will serve this purpose, and he asks that it be passed. The Governor also says that the law governing corporation taxes is inequitable in its operations upon different corporations. Some corporations are assessed upon assets and others upon capitalization. This was owing, says the Governor, to insufficient clearness in phrasing the amendment of 1906. The State loses more than \$400,000 a year by reason of this uneven incidence of the tax. The Governor says:

"If this franchise tax upon corporations is computed upon the par value of issued stock its collection will require only a simple mathematical calculation, which any taxpayer can understand and which will avoid the necessity for the exercise of judgment on the part of the assessing official, which frequently, and of necessity, must be arbitrary.

"Senate Bill 1577, by Mr. Harte, proposes a simple mathematical rule for the assessment of this tax, following as closely as possible the general theory of the existing statute and conforming to the recommendations of the Comptroller's office.

"This bill proposes a minimum tax of three-quarters of one mill on each dollar of issued capital stock employed within the State. This amounts to a charge of \$75 on a capitalization of \$100,000 for the privilege of using a corporate name and exercising corporate powers. When dividends higher than 3 per cent are declared the tax is increased one-quarter of a mill for each 1 per cent of dividends, thus being equivalent to an income tax of 2½ per cent. On corporations paying 6 per cent of dividends or over the rate and amount of tax would be exactly the same as under the existing law. All necessity for appraisal and all possibility of dispute and litigation in regard to corporations paying less than 6 per cent dividends will be eliminated."

The Questions of Betterments and Franchise Amendments in Cleveland

At the regular meeting of the City Council of Cleveland, Ohio, on the evening of July 3, 1911, G. M. Dahl, street railway commissioner, read correspondence to the effect that the Cleveland Railway refused to guarantee the expenditure of \$2,500,000 at once for betterments and extensions, and objected to the proposed amendments to the Tayler franchise to give the city power to dictate betterments and extensions through the last fifteen years of the life of the franchise and to take over the property at any time the State laws permit, instead of after 1918, as originally fixed. The letters were written by J. J. Stanley, president of the company, and were based upon the action of the directors.

Mr. Dahl stated that he had written the company that he would recommend that the amendments be defeated or tabled in case the company would not agree to the guarantee, and that he would work against their adoption if they

came up for passage. On June 27, 1911, Mr. Dahl asked the directors of the company to take steps to insure the expenditure of \$2,500,000 for betterments and extensions, and suggested a form of personal guarantee for the directors to sign, which was as follows:

"In the event that said sum cannot be raised by the company by either an increase in the floating debt or the sale of the company's bonds, the undersigned individually agree to take and subscribe for \$2,500,000 par value of stock of the Cleveland Railway at par prorated among the undersigned in proportion to their present holdings of stock in said company."

In his letters to the company Mr. Dahl argued that the officers of the company had indicated in the past that they would be willing to give this guarantee and that they wanted such legislation as would bring their stock up to par. He said that the refusal was given without a suggestion of an alternative.

Councilman Haserodt offered an amendment to the ordinance which would make it void in case the company did not furnish the proper guarantee. This was referred to the street railway committee for consideration.

During the last week in June Commissioner Dahl and Chairman Kramer of the street railway committee of the Council conferred with the officers and attorneys of the company in an effort to adjust the matter. Andrew Squire, attorney for the company, gave the officials of the city to understand that the differences might be adjusted if members of Council would take a more reasonable view of the matter. Mr. Squire said the company was opposed to accepting the amendment giving the city power to require extensions during the last fifteen years of the life of the grant, and that it was opposed to giving a guarantee in the form proposed because it implied a lack of confidence in the financial ability of the company and might affect the sale of the stock.

Mr. Dahl said that the company's letter was so worded as to lead him to believe that the company would consider no alternative in the matter of guaranteeing the expenditure for betterments.

At the regular meeting of the Cleveland City Council on the evening of July 10, 1911, the amendments to the Tayler grant, which have been under discussion for some time, were adopted, with some changes demanded by the company. On July 11 they were accepted by the company and if a petition is not presented for a referendum vote within thirty days they will become operative. The amendment relating to the date after which the city may take over the property was changed from Jan. 1, 1912, to Jan. 1, 1918. The section giving the city the right to dictate betterments and extensions during the first ten years of the franchise was allowed to stand. The amendments require that the company shall expend \$2,500,000 for extensions and betterments at once and provide that the amendments may be repealed if this is not done. The amendment relating to the extension of low fare to the suburbs was changed so that Collinwood or a part of the town may have the benefit of the reduced fare, but the fare in the city cannot be extended to other suburbs that may be made part of the city in the future.

J. J. Stanley, president of the company, states that the company will probably order fifty or sixty cars and that when the power is increased sufficiently others will be ordered until the desired 200 are secured. As to other improvements no decision has yet been reached.

It is reported that the State Tax Commission has placed a tentative value of \$17,500,000 on the property of the Cleveland Railway. This is the value arrived at by the late Judge Tayler when he prepared the grant under which the company now operates. A hearing will be given the company.

From an unknown source the land along Kingsbury Run has been offered the city for a public park, provided a street or electric railway is allowed to operate through the property for its entire length. This would give a right-of-way from the city limits to within 300 ft. of the Public Square. It is said that this is a plan to bring the inter-urban cars from the south and east into the city over a private right-of-way which will permit of rapid transit. Men interested in the Shaker Heights Land Company and the Shaker Heights Improvement Company are thought to be behind this plan, as it will open for improvement a vast

amount of land in the neighborhood of their properties. George J. Sandrock, W. H. Gartwick and O. P. Van Sweringen are officers of these companies.

Max L. Goodman has announced that he will ask Council for a franchise for a double-track electric railway on the East Side, to operate as a belt line, and at the same time take care of cross-town business.

Hearing to Be Held in Regard to Use of Power Brakes in Greater New York

The Public Service Commission of the First District of New York has decided to hold a public hearing on July 20, 1911, to determine the advisability of requiring all the surface railways in Greater New York to equip their cars with power brakes and folding steps pursuant to a vote taken at a meeting of the commission upon a report of its engineers. Commissioner Eustis will conduct the hearings. The new cars of the Third Avenue Railroad and some of those of the Metropolitan Street Railway are equipped with power brakes and folding steps, but a majority of the cars in service in New York are equipped with hand brakes. The Brooklyn Rapid Transit system has power brakes on 462 convertible cars and hand brakes on 545 of the same kind of cars. Its open cars, numbering 911, and its closed cars, numbering 597, are equipped with hand brakes only. The Coney Island & Brooklyn Railroad has hand brakes on all its cars, numbering 450. The Metropolitan Street Railway has hand brakes on 947 and power brakes on 549 of its closed cars. Its open cars number 455 and are equipped with hand brakes only. The Third Avenue Railroad has 201 closed cars and 379 convertible cars, its entire equipment in these two types being equipped with power brakes, while it has seventy-five open cars with hand brakes. The Union Railway has hand brakes on 498 cars and power brakes on seventy-eight of its convertible cars. The Yonkers Railroad has power brakes on 122 cars and only six cars with hand brakes. With most of the other companies hand brakes are the rule, although the New York & Queens County Railway has 121, the New York & Long Island Traction Company thirty and the Ocean Electric Railway twenty-four cars equipped with power brakes. As a result of a study of the question made by E. G. Connette, the transportation engineer of the commission, he has recommended that all cars weighing 25,000 lb. or more should be equipped with power brakes. If the commission should order power brakes for all double-track cars it would mean the equipment of a total of 3630 cars, distributed among the following companies:

Metropolitan Street Railway.....	622
Second Avenue Railroad.....	250
Brooklyn Rapid Transit.....	1,807
Coney Island & Brooklyn Railroad.....	459
Long Island Electric Railway.....	16
New York City Interborough Company.....	40
Richmond & Midland Companies (Staten Island).....	20
Union Railway.....	416

In 1910 455 accidents were reported with double-track cars equipped with hand brakes.

Selecting the Third Arbitrator in Toledo

On the evening of July 3, 1911, Albion E. Lang, president of the Toledo Railways & Light Company, sent a letter to Mayor Brand Whitlock in regard to the appointment of Judge Killits, of the United States Court for the Western District of Ohio, as the third member of the board to appraise the property of the company. In this letter Mr. Lang stated that the board of directors of the company thought a man with technical training should be selected. Mr. Lang said substantially:

"I am instructed by the board to advise you of their appreciation of the city's desire of an equitable settlement of the transportation problems and your approval of the appointment of an umpire or arbitrator in the appraisal of the properties of the company for the purpose of fixing the rate of fare in the contemplated ordinance. Our board of directors, however, remains of the opinion, as heretofore expressed, that such umpire or arbitrator should also be a man, by training and experience, thoroughly qualified to

pass upon the technical questions certain to come before him for consideration.

"To appraise a property embracing so many elements necessarily requires extensive knowledge of values and expenses only to be had by personal experience and study or by that instruction which is derived from the hearing of evidence and arguments as in court. We can find no means by which the attendance of witnesses can be had and their testimony given under oath. An arbitrator or umpire, inexperienced in the construction and operation of street railways, uninstructed by witnesses speaking under the sanction of an oath and subjected to the explanations and qualifications which are assured by cross-examination, would necessarily be acting upon insufficient information. That it seems to us, would prove unsatisfactory.

"We shall hope to name an appraiser who in experience, ability and skill will stand with Prof. E. W. Bemis, and feel that their differences, if any, should be passed upon by some disinterested person qualified by technical knowledge and experience to decide between them without outside assistance. Such an appraisal would doubtless be practically unanimous and of great value, reflecting not only credit on the appraisers as individuals, but upon the city administration in originating a modern and progressive method of bringing to the citizens a just basis upon which a fair and proper settlement of the question can be had unattended by the disagreements, delays and great expense which have attended the consideration of the subject in other communities.

"I am therefore directed by the board to request your further consideration of the subject in the hope that in this matter, so necessary for a mutually satisfactory conclusion of the negotiations, the city and company may be in entire accord."

Rehabilitation Contracts in Philadelphia

The directors of the Philadelphia (Pa.) Rapid Transit Company have approved the first of the contracts entered into by Thomas E. Mitten, acting chairman of the board of directors of the company, for the rehabilitation of the property. The company has contracted with The J. G. Brill Company, Philadelphia, Pa., for thirty elevated cars and has entered into an agreement with the Philadelphia Electric Company by which that company will supply the railway with power, it not being possible for the company's own plants last winter fully to meet the demands of traffic at times.

Mr. Mitten retained Frederick Sargent, of Sargent & Lundy, Chicago, Ill., consulting engineer of the Commonwealth Edison Company, Chicago, Ill., to study the plans for developing the Delaware Avenue power house of the company, with the result that by Jan. 1, 1912, the capacity of the plant will be increased by 6,000 kw. The contract with the Philadelphia Electric Company is to run from Nov. 1, 1911, to Oct. 31, 1916.

Strike in Mexico City

Because their arbitrary demands for an increase in wages were not granted summarily by the company many of the conductors, motormen and inspectors of the Mexico Tramways, Mexico City, Mex., went on strike at noon on July 3, 1911. Conductors, who received 15 cents an hour, demanded 20 cents an hour; motormen, who received from 17 cents to 24 cents an hour, demanded 25 cents an hour, and inspectors, who received 25 cents an hour, demanded 30 cents an hour. The company made no effort to operate cars immediately following the strike, but announced that it would resume service on July 5, 1911, if adequate police protection was afforded. All the American places of business in the city were closed on July 4, 1911, and the city took on a general holiday aspect, being patrolled by squads of mounted police ready to deal with the incipient disorder which was much in evidence. Late on July 4, 1911, a committee of the employees signed an agreement with the management, but many of the striking employees refused to be bound by the terms of the protocol, and the men who returned to work were severely maltreated. In one case

of disorder the police fired into the mob and injured several persons. On July 6 there was also a serious tilt between the police and the mob near the Indianalla car house. On July 7 the men on strike evidently became convinced that the police proposed to deal severely with all lawbreakers, and they voted to return to work on what are said to be precisely the same conditions of service as the committee representing them had previously agreed to accept in their behalf.

Petition to Abolish Los Angeles Commission.—Two petitions have been filed with the Council of Los Angeles, Cal., to abolish the Board of Public Utility Commissioners of Los Angeles.

New Line Opened at Atlanta.—The Fairburn & Atlanta Railway & Electric Company has placed its line in service between Fairburn and College Park, Ga., where connections are made with the lines of the Georgia Railway & Electric Company for Atlanta.

Engineers Appointed to Study Chicago Electrification.—Louis H. Evans, former chief engineer of Chicago Junction Railway, and Hugh Patterson, who was connected with the electrification of the New York terminals of the Pennsylvania Railroad, have been appointed special engineers by the Chicago Association of Commerce to study plans for complete electrification of all steam terminals in Chicago.

Offer Made by City for Seattle, Renton & Southern Railway.—The Board of Public Works of Seattle has voted to offer the Seattle, Renton & Southern Railway \$386,053 for its property. The offer will be made in accordance with the resolution passed at the last municipal election to authorize an issue of bonds to the extent of \$800,000 to purchase the road. The company has sixty days in which to accept the terms made. If the offer is refused then it is provided that the price to be paid for the property shall be fixed by arbitration.

Public Invited to Inspect Nashville Property.—The Nashville Railway & Light Company, Nashville, Tenn., is inviting the public in a series of advertisements in the daily papers to inspect the plant and shops of the company at stated times. One of the advertisements follows: "You are cordially invited to honor us with your presence this afternoon on a tour of inspection through our mammoth power plant, car shops, carpenter shop, paint shop, Y. M. C. A. and other departments. Parties will leave the general office in the Watkins Building, at 3 p. m. Come—and bring a friend."

Onerous Franchise Conditions in Louisville.—Public agitation regarding the term of the so-called cross-town ordinance which is now pending in the General Council at Louisville, Ky., has been aroused by the commercial organizations, which have petitioned the Council not to pass the measure as it stands at present, but to include provisions for exchange of service with future interurban lines, to fix the "maximum" fare at 5 cents, so as to make it possible to bring about reductions in the future, and to require the purchaser of the franchise to give a bond for the construction of the line. The Louisville Railway is satisfied with the measure in its present form, but it is doubtful if it will bid on a privilege with restrictions such as have been suggested.

S. M. Felton on Electrification of Railroads Operating Into Chicago.—S. M. Felton, president of the Chicago Great Western Railroad, who has recently returned from Europe, has suggested that a committee of mechanical experts and firemen should be sent abroad to study some of the English ideas as to correct locomotive-firing and smoke-consuming devices with a view to applying at once the knowledge thus gained to alleviate conditions in Chicago. Mr. Felton is quoted as follows: "Electrification is necessarily far off, but a great deal may be done in three months in the way of preventing smoke. There are twelve roads entering London, all operated by steam and carrying more passengers than ours do, without smoke and without any complaints of a smoke nuisance. This is due to their methods of firing and their handling of locomotives. The English roads are far ahead of ours in their success with devices to insure proper consumption of the coal gases before they become smoke."

Financial and Corporate

New York Stock and Money Markets

July 12, 1911.

The market opened with fair activity on Monday upon news of rainfall in important crop sections, but prices reacted when the government report on crops was made public. The bond market is a shade less active than heretofore and the condition is regarded as a result of sufficing investment demand temporarily. Trading to-day was light, with stocks reactionary, and the money market was a trifle firmer. Quotations July 12 were: Call, 2¼@2½ per cent; ninety days, 2¾@3 per cent.

Other Markets

Tractions have been the leading issues in Philadelphia the entire week and new levels were reached to-day by Philadelphia Rapid Transit and Union Traction.

The Chicago market has been strong throughout the week and prices have advanced. Trading to-day was in good volume and gains were made in nearly every issue on the list. Lake Street Elevated Railways 5s opened at 85 and reached 87, at which sales were made. Interest was shown in the elevated notes.

Very little business is being effected on the Boston exchange, and trading to-day was light, with few price changes.

The Baltimore list is firm but quiet. United Railways 5 per cent notes were in demand in the market to-day and slight gains were registered.

Quotations of traction and manufacturing securities as compared with last week follow:

	July 1.	July 12.
American Light & Traction Company (common).....	295	a310
American Light & Traction Company (preferred).....	108	a108
American Railways Company.....	a43¾	44
Aurora, Elgin & Chicago Railroad (common).....	*40¾	a45
Aurora, Elgin & Chicago Railroad (preferred).....	*85¾	a87
Boston Elevated Railway.....	a129	a129
Boston Suburban Electric Companies (common).....	a15	a15
Boston Suburban Electric Companies (preferred).....	a75	75
Boston & Worcester Electric Companies (common).....	12	a13
Boston & Worcester Electric Companies (preferred).....	a59	a57½
Brooklyn Rapid Transit Company.....	81	83½
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	86¾	87½
Capital Traction Company, Washington.....	*127¾	a127
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	3	*3
Chicago & Oak Park Elevated Railroad (preferred).....	5	*5
Chicago Railways, pteptg., ctf. 1.....	85	a90
Chicago Railways, pteptg., ctf. 2.....	24	a26½
Chicago Railways, pteptg., ctf. 3.....	9½	a10
Chicago Railways, pteptg.....	5½	5½
Cincinnati Street Railway.....	*130¾	a130½
Cleveland Railway.....	*96	a27½
Columbus Railway (common).....	*96	81½
Columbus Railway (preferred).....	*101	92
Consolidated Traction of New Jersey.....	76	a76
Consolidated Traction of N. J., 5 per cent bonds.....	105½	a105
Dayton Street Railway (common).....	a30	a25
Dayton Street Railway (preferred).....	a100	a100
Detroit United Railway.....	74	79
General Electric Company.....	160	162½
Georgia Railway & Electric Company (common).....	a153	a163
Georgia Railway Electric Company (preferred).....	a93½	152
Interborough Metropolitan Company (common).....	17½	18
Interborough Metropolitan Company (preferred).....	a50	50½
Interborough Metropolitan Company (4½s).....	78¾	78¾
Kansas City Railway & Light Company (common).....	19	a19
Kansas City Railway & Light Company (preferred).....	44	44
Manhattan Railway.....	137½	137½
Massachusetts Electric Companies (common).....	a23	a23½
Massachusetts Electric Companies (preferred).....	*91½	a94¾
Metropolitan West Side, Chicago (common).....	a26½	27½
Metropolitan West Side, Chicago (preferred).....	a75	a75
Metropolitan Street Railway, New York.....	15	15
Milwaukee Electric Railway & Light (preferred).....	110	*110
North American Company.....	73¾	a74½
Northern Ohio Light & Traction Company.....	*48	a49¾
Northwestern Elevated Railroad (common).....	a29	a30
Northwestern Elevated Railroad (preferred).....	a69	70
Philadelphia Company, Pittsburgh (common).....	a56	56
Philadelphia Company, Pittsburgh (preferred).....	a43¾	a43½
Philadelphia Rapid Transit Company.....	a19½	a20¾
Philadelphia Traction Company.....	a86½	a86¾
Public Service Corporation, 5% col. notes (1913).....	101	101
Public Service Corporation, cts.....	107½	a107
Seattle Electric Company (common).....	a110	a111
Seattle Electric Company (preferred).....	a102½	102½
South Side Elevated Railroad (Chicago).....	a79	a80¾
Third Avenue Railroad, New York.....	10½	a10½
Toledo Railways & Light Company.....	8	a7¾
Twin City Rapid Transit, Minneapolis (common).....	*108½	a108½
Union Traction Company, Philadelphia.....	a49¾	a50½
United Rys. & Electric Company, Baltimore.....	*19½	*19½
United Rys. Inv. Co. (common).....	39	a39
United Rys. Inv. Co. (preferred).....	69½	70
Washington Ry. & Electric Company (common).....	35¾	a42¾
Washington Ry. & Electric Company (preferred).....	90	a89
West End Street Railway, Boston (common).....	a89	a89½
West End Street Railway, Boston (preferred).....	a103	a103
Westinghouse Elec. & Mfg. Co.....	a75¾	75½
Westinghouse Elec. & Mfg. Co. (1st pref.).....	119	a120

a Askcd. *Last sa e.

ANNUAL REPORTS

Cleveland, Painesville & Eastern Railroad

Earnings and expenses of the Cleveland, Painesville & Eastern Railroad for the year ended Dec. 31, 1910, with a comparison, were as follows:

	1910.	1909.
Earnings.....	\$286,185	\$263,564
Passenger revenue.....	3,931	4,147
Special car revenue.....	250	77
Mail revenue.....	19,522	16,924
Express revenue.....	8,696	7,382
Milk revenue.....	1,270	964
Station and car privileges.....	701	711
Telephone and telegraph service.....	6,081	11,099
Rent of tracks and terminals.....	9,908	9,165
Rent of equipment.....	1,468	376
Rent of building.....	4,238	689
Power.....	13,219	6,075
Miscellaneous.....		
Total.....	\$355,469	\$321,173
Expenses.....	1909.	1909.
Maintenance of way and structures.....	\$34,854	\$34,006
Maintenance of equipment.....	21,445	24,026
Conducting transportation.....	78,948	65,935
General.....	39,922	9,942
Total.....	\$175,169	\$163,908
Net earnings.....	\$180,300	\$157,265
Interest and taxes.....	106,618	101,283
Surplus.....	\$173,682	\$55,982

E. W. Moore, the president, says in part:

"During the latter part of the year work was started on a culvert and fill at Willoughbeach Park to eliminate the reverse curve and trestle at this place.

"A new overhead system was put up in the Willoughby carhouse yards to go with special work.

"A building 20 ft. by 40 ft. was built in the rear of the station at Willoughby having a basement and first floor, which is used for the Electric Package Agency, storage and cleaning of lamps, etc."

Traffic statistics are as follows:

	1910.	1909.
Per cent of operation.....	49.27	51.03
Car-miles.....	923,705	917,124
Income per car-mile, cents.....	38.48	35.02
Operating per car-mile, cents.....	18.96	17.87
Net earnings per car-mile, cents.....	19.52	17.15
Passengers carried.....	2,311,090	2,072,179
Earnings per passenger, cents.....	12.38	12.72

Easton Consolidated Electric Company

A report of operations of the Easton (Pa.) Consolidated Electric Company for the year ended Dec. 31, 1910, shows the following:

Gross revenue—rail lines.....	\$381,492	
Operating expenses.....	226,089	
Earnings from operation.....		\$155,402
Deduct:		
Interest on bonds, taxes, etc.....	\$54,945	
Deficit Easton Amusement Company.....	3,796	
		58,741
Net earnings from operation of railway lines.....		\$96,661
Edison Illuminating Company—rentals, less taxes and expenses.....		27,759
Interest received.....		385
Total earnings.....		\$124,805
Deduct charges of Easton Consolidated Electric Company:		
Interest on collateral trust bonds.....	\$61,850	
Expenses and taxes.....	8,459	
		70,309
		\$54,496

Joseph S. Lovering, the president, says in part:

"The earnings from railway operations for the year ended Dec. 31, 1910, were \$381,492, as compared with \$352,408 for the previous year, an increase of \$29,083, the number of passengers carried being approximately 600,000 in excess of those carried during the year 1909, while the car mileage was 1,606,435 as against 1,644,243, a decrease of 2.29 per cent.

"The ratio of operating expenses to gross earnings was 59.26 per cent, a decrease of 3.78 per cent as compared with the previous year.

"The item of \$58,741 shown in the above statement, comprising interest on bonds, taxes, etc., is approximately \$5,700 in excess of similar expenses for the year 1909. This is due in the main to the increase in the amount of taxes paid.

"The remaining items on the statement do not show any material change as compared with the previous year. The net profit for the year was \$54,496, an increase of \$19,065 over the net profits for the year 1909."

American Light & Traction Company

Earnings for the year ended Dec. 31, 1910, compare with the previous year as follows:

Year ended, Dec. 31.	1910.	1909.
Earnings on stock of subsidiary companies owned by this company.....	\$3,387,883	\$3,033,668
Miscellaneous earnings.....	444,668	311,772
Gross earnings.....	\$3,832,551	\$3,345,440
Expenses.....	119,688	106,261
Net earnings.....	3,712,863	3,239,179
Surplus and reserve, Dec. 31, previous year.....	5,999,065	5,683,137
Total surplus earnings.....	\$9,711,928	\$8,922,316
Cash dividend on preferred stock.....	\$854,172	\$854,172
Cash dividend on common stock.....	997,560	778,494
Stock dividend on common stock.....	997,565	1,290,585
Total dividends.....	\$2,849,297	\$2,923,251
Surplus balance.....	\$6,862,631	\$5,999,065

Proposed Increase in Capitalization of Columbus Railway

A meeting of the stockholders of the Columbus (Ohio) Railway was held in Columbus on June 26, 1911, to consider the proposition to increase the capital stock of the company from \$7,000,000 to \$10,000,000, the increase to be divided equally between common and preferred stocks, as noted in the *ELECTRIC RAILWAY JOURNAL* of July 8, 1911, page 94. A resolution to increase the stock was introduced, after which Butler Sheldon, the president of the company, made a statement showing the necessity of the increase in order to take care of the business of the company. At the close of his statement, he suggested that the meeting adjourn to some future day, in order to admit of an audit of the accounts of the company from the time of the execution of the lease to be made by some certified public accountant and that a committee of stockholders be appointed to confer with the board of directors in reference to such audit. This recommendation was favorably received and upon motion of Mead Massie, Chillicothe, a resolution was adopted providing for the adjournment of the meeting to Aug. 28, 1911, and that the chairman should appoint a committee of five stockholders to take up the matter of such audit with the board of directors. The following committee was appointed: D. M. Massie, Chillicothe; C. L. Poston, Nelsonville; Angus Dunn, Columbus; Prof. Edward Orton of the Ohio State University, and John A. Poland, Chillicothe. The committee organized by the election of Mr. Massie as chairman and Mr. Poland as secretary.

Mr. Sheldon concluded his statement as follows:

"You will understand that when an increase of the authorized capital of \$3,000,000 is requested it is with no idea of issuing any more of the authorized capitalization than is absolutely necessary to pay for your new property and betterments under the lease, nor will the Columbus Railway & Light Company acquire any more new property for you nor make any more betterments to your property than are necessary, because upon each new share of stock issued it must pay the guaranteed dividend. The amount of the proposed increase may seem to you large, but your board believes that it is none too large to provide capital for the future needs of your company and avoid the necessity of going through the publicity of legally increasing your capital stock, which often has a depreciating effect on the market value of your shares.

"At the time of the execution of the lease in 1903, the number of passengers carried on your lines was 34,709,000, while the estimated number of passengers to be carried in 1911 is 51,000,000. This statement will show you how rapidly new property and new betterments are required to take care of the necessary development of your company's business. In 1906 the lease was amended in three particulars, all of which are in favor of your company.

"First—Under the original lease, when we paid bills for new property and betterments in our 4 per cent bonds, it was provided that the Columbus Railway & Light Company should take these bonds at 92½ per cent because they were worth only that in the market. By the amendment these were to be taken at par. The reason for this change was that at that time your company had practically no profit and loss account with which to take care of this discount.

"Second—The amendment provides that on the maturity of the bond issues of your company the Columbus Railway & Light Company must provide the funds with which to retire the bonds and shall be reimbursed by your company. In the original lease the burden of financing this matter devolved on your company.

"Third—The provisions of Section 8 were still further elaborated to carry out the method of arriving at the amount of the replacement cost to be charged to your company.

"The stock of your company is in the hands of about 1700 persons, many of them being women and estates. Some of our stockholders think that there should be an audit of these accounts from the time the lease was executed, a plan which I, speaking for myself, and on behalf of your board of directors, most heartily approve, and I also approve of the plan of having such audit brought down to date each year in advance of the annual meeting of stockholders. I, therefore, suggest that if it meets with your approval, this meeting be adjourned to some future date in order that such audit may be made by a certified public accountant, and that a committee of stockholders be appointed to confer with your board as to such audit and also to go over the affairs of the company."

Buffalo & Lackawanna Traction Company, Buffalo, N. Y.—The Public Service Commission of the Second District of New York has authorized the Buffalo & Lackawanna Traction Company to expend \$196,000, part of the proceeds of the sale of bonds heretofore authorized, to purchase rolling stock and equipment. Of this sum \$101,000 was originally provided to reconstruct a bridge over the ship canal and a viaduct over the tracks of the Erie Railroad, but it is found that it is not necessary that it be used for that purpose at this time. The company also has \$95,000 saved from the amount thought necessary to construct its roadbed originally, and it is proposed to devote these two sums to the purchase of rolling stock and equipment.

Chicago (Ill.) Elevated Railways.—The National City Bank, New York, received subscriptions until 3 p. m., July 10, 1911, for the \$30,000,000 of Chicago Elevated Railways' three year 5 per cent gold notes at 98½ and accrued interest, at which price the notes yield 5½ per cent. The issue was oversubscribed. The notes are dated July 1, 1911, and are due on July 1, 1914, and will be in coupon form of \$1,000 each, interest being payable on Jan. 1 and July 1 in Chicago and in New York. The issue is callable as a whole on thirty days' notice at 100 and accrued interest. The committee, consisting of F. A. Vanderlip, Henry A. Blair and Samuel McRoberts, notified holders who had not deposited their stock of the South Side Elevated Railroad, Metropolitan West Side Elevated Railway and Northwestern Elevated Railroad, under deposit agreement dated May 22, 1911, that the time for delivery would be extended until July 17, 1911.

Chicago (Ill.) Railways.—The National City Bank, New York, N. Y., and Harris, Forbes & Company, New York, N. Y., are offering for subscription at 99¾ and interest \$5,000,000 of the first mortgage 5 per cent gold bonds of the Chicago Railways, dated Feb. 1, 1907, and due Feb. 1, 1927. The report of the company for the year ended June 30, 1911, follows: Gross earnings, \$15,538,860; operating expenses, including taxes and maintenance, \$10,790,225; net earnings, \$4,748,635; annual interest charge, including the present issue, \$2,297,750; balance, \$2,450,855.

Citizens' Railway & Light Company, Ft. Worth, Tex.—The railway property of the Citizens' Railway & Light Company was sold under foreclosure on July 3, 1911, for \$400,000 to G. H. Clifford, general manager of the Northern Texas Traction Company, Ft. Worth, representing Stone & Webster, Boston, Mass. The lighting property of the company was sold at the same time to S. B. Cantey, who is said to represent the J. R. Nutt Company, Cleveland, Ohio.

Concord, Maynard & Hudson Street Railway, Maynard, Mass.—The Railroad Commissioners of Massachusetts have approved the petition of the Concord, Maynard & Hudson Street Railway for approval of terms of consolidation with the Lowell, Acton & Maynard Street Railway; also its petition for authority to issue 350 additional shares of stock of

a par value of \$100, to be issued to carry out the terms of contract, and to be exchanged share for share for the outstanding stock of the Lowell, Acton & Maynard Street Railway.

Orange County Traction Company, Newburgh, N. Y.—The Public Service Commission of the Second District of New York has authorized the Orange County Traction Company to issue \$83,500 of 5 per cent fifty-year bonds, the proceeds to be used to pay for property at Orange Lake Park and a second track from West Street and Broadway, Newburgh, to Orange Lake Park and also for new equipment at its power house and for its new carhouse in Newburgh.

Pennsylvania-Jersey Traction Company, Easton, Pa.—The Board of Public Utility Commissioners of New Jersey has approved an issue of \$100,000 of 6 per cent serial collateral notes by the Pennsylvania-Jersey Traction Company to refund outstanding obligations of the company.

Riverside Traction Company, Trenton, N. J.—The Board of Public Service Commissioners of New Jersey has refused to approve the petition of the Riverside Traction Company for the issuance of bonds to the value of \$100,800.

Sedalia Light & Traction Company, Sedalia, Mo.—Judge Pollock, in the United States Circuit Court at Jefferson City, Mo., on June 27, 1911, granted the Sedalia Light & Traction Company forty days in which to adjust its indebtedness of \$807,000 to the City Trust Company, Boston, Mass. E. F. Swinney, Kansas City, Mo., has been named as master to carry into effect the order of the court, which is a decree of foreclosure subject to the limitation named.

Twenty-eighth & Twenty-ninth Streets Crosstown Railroad, New York, N. Y.—The committee representing the holders of the first-mortgage 5 per cent bonds of the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad submitted to the Public Service Commission of the First District of New York, on July 11, 1911, a plan for the reorganization of the company which provides for the sale of the \$1,500,000 of first-mortgage bonds to the Third Avenue Railroad at 30 per cent of their par value, and for scaling down the capital liabilities of the company from \$3,000,000 to \$1,500,000. At present there are outstanding \$1,500,000 of bonds and \$1,500,000 of stock. Under the reorganization plan, it is said, there will be \$1,000,000 of first-mortgage bonds and \$500,000 of stock. The commission has set Sept. 22, 1911, as the date for a hearing on the plan.

Twin City General Electric Company, Ironwood, Mich.—The Gogebic Electric Railway & Light Company has taken over the Twin City General Electric Company, the Ironwood Water Works Company and the Hurley Water Works Company, and now controls all the electric railway and light properties in Gogebic County, Mich.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—McCoy & Company and Devitt, Tremble & Company, Chicago, Ill., are offering for subscription the unsold portion of \$500,000 of an authorized issue of \$1,800,000 of first-mortgage sinking fund 5 per cent gold bonds of the Waterloo, Cedar Falls & Northern Railway, dated Jan. 1, 1910, and due Jan. 1, 1940. The bonds are redeemable on any interest date on or after Jan. 1, 1915, at 105 and accrued interest. The First Trust & Savings Bank, Chicago, Ill., is trustee of the issue. A statement follows of the earnings of the company for the year ended March 31, 1911, published in connection with the offer of the bonds: Gross earnings, \$276,419; operating expenses and taxes, \$131,563; net earnings, \$144,855; interest on first mortgage bonds outstanding, \$90,000; surplus for corporate purposes, \$54,855.

West Penn Traction Company, Pittsburgh, Pa.—All of the lighting and power companies in Greene and Washington Counties and in the Ohio River valley, west of Pittsburgh, have been purchased by the West Penn Traction Company, and an offering of bonds will be made shortly by a syndicate composed of J. S. & W. S. Kuhn, Inc., Pittsburgh; Newburger, Henderson & Loeb, and Brown Brothers & Company, New York and Philadelphia; H. B. Hollins & Company, New York, and the Commonwealth Trust Company, Pittsburgh, Pa. The new plants will add greatly to the electric light and power department of the West Penn Traction Company.

Dividends Declared

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, preferred; 3 per cent, common.
 Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.
 Cedar Rapids-Iowa City Railway & Light Company, Cedar Rapids, Ia., 3 per cent, preferred.
 City Railway, Dayton, Ohio, quarterly, 1½ per cent, preferred; 1¼ per cent, common.
 Danbury & Bethel Street Railway, Danbury, Conn., 2 per cent.
 Dayton & Troy Electric Railway, Dayton, Ohio, 1¼ per cent, preferred; 1¼ per cent, common.
 East St. Louis & Suburban Railroad, East St. Louis, Ill., quarterly, 1¼ per cent, preferred.
 Indianapolis Traction & Terminal Company, Indianapolis, Ind., 2 per cent.
 Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.
 Montreal (Que.) Street Railway, 2½ per cent.
 New Orleans City Railroad, New Orleans, La., \$2.50, preferred; \$1, common.
 Public Service Investment Company, Boston, Mass., quarterly, \$1.50, preferred, quarterly; \$1.50, common.
 Union Traction of Indiana, Anderson, Ind., 1 per cent, common.
 York (Pa.) Railways, 50 cents, preferred.

MONTHLY ELECTRIC RAILWAY EARNINGS

		AMERICAN RAILWAYS.					
Period.		Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.	
1m.,	May, '11	\$354,618	.....	.....	.....	.....
1 "	" '10	335,208	.....	.....	.....	.....
11 "	" '11	3,667,417	.....	.....	.....	.....
11 "	" '10	3,448,024	.....	.....	.....	.....
		BROOKLYN RAPID TRANSIT.					
1m.,	Mar., '11	\$1,806,278	*\$1,285,626	\$520,652	.....	.....
		CENTRAL PARK, NORTH & EAST RIVER RAILROAD.					
1m.,	Mar., '11	\$48,639	*\$55,809	\$7,169	.....	.....
		CLEVELAND, PAINESVILLE & EASTERN RAILWAY.					
1m.,	May, '11	\$33,138	*\$18,096	\$15,042	\$8,113	\$6,930	
1 "	" '10	30,255	*15,289	14,967	8,226	6,741	
5 "	" '11	127,953	*73,221	54,732	40,804	13,928	
5 "	" '10	120,318	*66,730	53,588	39,904	13,684	
		CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY.					
1m.,	May, '11	\$97,116	\$53,698	\$43,418	\$29,946	\$13,273	
1 "	" '10	90,161	50,205	39,955	29,794	10,161	
5 "	" '11	424,028	247,352	176,676	150,095	26,580	
5 "	" '10	386,283	238,758	147,525	148,970	1,445	
		COMMONWEALTH POWER RAILWAY & LIGHT COMPANY.					
1m.,	May, '11	\$422,709	*\$249,004	\$173,705	\$103,281	\$70,424	
1 "	" '10	392,792	*218,632	174,160	103,926	70,234	
5 "	" '11	2,196,470	*1,249,577	946,893	511,494	435,399	
5 "	" '10	2,003,264	*1,133,739	869,525	510,230	359,295	
		CONEY ISLAND & BROOKLYN RAILWAY.					
1m.,	Mar., '11	\$103,575	*\$75,752	\$27,824	.....	.....
		DETROIT UNITED RAILWAY.					
1m.,	June, '11	\$903,130	\$540,749	\$362,382	\$176,149	\$186,234	
1 "	" '10	807,577	476,301	331,277	163,368	167,908	
5 "	" '11	3,943,772	2,462,778	1,480,994	880,099	600,895	
5 "	" '10	3,574,228	2,257,789	1,316,439	804,527	511,912	
		HUDSON & MANHATTAN RAILROAD.					
1m.,	Mar., '11	\$263,049	*\$117,458	\$145,591	.....	.....
		INTERBOROUGH RAPID TRANSIT COMPANY.					
1m.,	Mar., '11	\$2,742,785	*\$1,306,704	\$1,456,081	.....	.....
		LAKE SHORE ELECTRIC RAILWAY.					
1m.,	May, '11	\$105,322	*\$54,439	\$50,892	\$34,584	\$16,308	
1 "	" '10	100,425	*52,983	47,441	35,036	12,405	
5 "	" '11	444,636	*254,947	189,689	173,398	16,291	
5 "	" '10	423,194	*246,455	176,741	173,859	2,882	
		METROPOLITAN STREET RAILWAY.					
1m.,	Mar., '11	\$1,117,582	*\$845,843	\$271,739	.....	.....
		NEW YORK & QUEENS COUNTY RAILWAY.					
1m.,	Mar., '11	\$89,936	*\$99,411	\$9,474	.....	.....
		NORTHERN OHIO TRACTION & LIGHT COMPANY.					
1m.,	May, '11	\$228,693	*\$124,657	\$104,037	\$44,329	\$59,708	
1 "	" '10	207,323	*111,250	96,074	43,375	52,699	
5 "	" '11	977,579	*562,041	415,538	221,774	193,764	
5 "	" '10	865,662	*501,105	364,557	216,542	148,015	
		THIRD AVENUE RAILROAD.					
1m.,	Mar., '11	\$290,411	*\$158,623	\$131,789	.....	.....
		TOLEDO RAILWAYS & LIGHT COMPANY.					
1m.,	May, '11	\$256,268	\$154,171	\$102,097	\$79,191	\$22,906	
5 "	" '11	1,303,603	821,848	481,756	396,321	85,435	

*Includes taxes.

Traffic and Transportation

Additional Powers for the Illinois Railroad & Warehouse Commission

At the last session of the General Assembly of Illinois two statutes conferring additional power on the Railroad and Warehouse Commission of Illinois were enacted. They became effective on July 1, 1911. The first, entitled, "An act defining and regulating express companies and carriers by express within the State of Illinois, declaring them to be common carriers and placing them under the jurisdiction and control of the Illinois Railroad & Warehouse Commission," places all express companies under the supervision and control of the commission. The second statute materially increases the authority and jurisdiction of the commission. In order to advise the companies coming under the jurisdiction of the commission of the changes in the law the commission on June 13, 1911, addressed a circular to the companies which contained in condensed form the more important features of the new legislation. In this circular the commission said in part:

"The term 'common carrier,' as defined by Section 21, includes all railroad corporations, express companies, steamboat lines or other common carriers by water, private car line companies, sleeping car companies, fast freight line companies and also includes every other corporation, company, etc., operating any agency for public use in the conveyance of persons or property.

"Section 22 defines the term 'railroad' to include all railroads, other than a street railroad, by whatever power operated for public use in the conveyance of persons or property, with all bridges, ferries, tunnels, equipment and facilities used in its business.

"Section 24 provides that it shall be the duty of all common carriers to furnish transportation at reasonable rates upon order of the commission.

"Section 25 makes it unlawful to charge or receive a greater compensation in the aggregate for the transportation of passengers, or a like kind of property, for a shorter than for a longer distance over the same line or route in the same direction, and also provides that in special cases the commission may upon application and investigation authorize a common carrier to charge less for a longer than for shorter distances. No rate lawfully in existence at the time of the passage of this act shall be required to be changed prior to the expiration of six months after its passage.

"Section 26 provides that common carriers shall afford all reasonable, proper and equal facilities for the interchange of passengers and property traffic and prompt transfer of the same with every other common carrier and not discriminate in respect to rates, fares or charges between two or more common carriers.

"Section 27 authorizes the commission after hearing to establish through rates and joint rates for the transportation of persons and property and prescribe the division of such rates and the terms and conditions under which they shall be operated.

"Section 29 authorizes the commission to compel physical connections between railroads and establish reasonable switching limits and rules, regulation and rates therefor.

"Section 30 grants power to the commission to inquire into the business management of common carriers and to make and enforce orders for the safety and accommodation of persons or property transported.

"Section 32 directs the commission to make for each common carrier a schedule of reasonable maximum rates or charges, classification, rules and regulations for the transportation of persons or property, and to change or revise the same from time to time.

"Section 33 provides the penalty for unlawful neglect or refusal or failure to obey the order of the commission.

"Section 34 provides the method for the enforcement of the orders of the commission.

"Section 35 makes provision for appeal from the findings or order of the commission."

The statute providing for annual reports and the reports and investigation of accidents was not changed materially by the additional powers which have been conferred on the commission.

Freight Line Up Lookout Mountain.—The Chattanooga (Tenn.) Railway is considering a plan to establish freight service on the tracks formerly used by the company for its incline line up Lookout Mountain.

Additional Transfer Privileges in Boston.—Nine new transfer points were established by the Boston (Mass.) Elevated Railway on July 1, 1911. On the same day certain additional transfer privileges were extended to patrons of the company.

Collision on New Hampshire Electric Railways.—More than thirty persons were injured on July 4, 1911, in a head-on collision between two cars of the Lawrence Division of the New Hampshire Electric Railway, near Haverhill Junction.

Passes Discontinued in Sacramento.—The Sacramento Electric, Gas & Railway Company, Sacramento, Cal., has discontinued all passes and will in the future give each employee only four free rides a day. Policemen and firemen when not on duty will be required to pay fare.

Transfer Complaint Against Pittsburgh Railways.—William R. Mazurie, Swissvale, Pa., has filed a complaint with the Railroad Commission of Pennsylvania against the Pittsburgh Railways, alleging discrimination in the management of the transfer system, setting forth that a passenger can go from McKeesport to Pittsburgh for 10 cents via one route while the same trip via another route costs 15 cents.

Complaint Against Lewisburg, Milton & Watertown Passenger Railway.—The Business Men's Association of Milton, Pa., has filed a complaint against the Lewisburg, Milton & Watertown Passenger Railway. It is alleged that the trip books used by the company are acceptable only during certain hours in the morning and evening. The complainants feel that this is a discrimination and want the fare question investigated.

Sanitary Drinking Cups on the Aurora, Elgin & Chicago Railroad.—The Aurora, Elgin & Chicago Railroad, Chicago, Ill., has distributed several thousand sanitary drinking cups since July 1, 1911, when the act abolishing public drinking cups took effect in Illinois. The cups are made of paraffin paper and each is inclosed in a Manila envelope, which carries an attractive display advertisement of the company's high-speed suburban and interurban service.

Question of Transfers on Chicago Elevated Railways.—The City Council of Chicago has adopted a resolution introduced by Alderman Foell to direct the corporation counsel to report to the City Council as soon as possible the details of the consolidation of the elevated railways of Chicago and whether the city has power to enforce the section of the municipal code regarding transfers in the event of the merger of the traction companies.

Commutation Fares on Chautauqua Traction Company's Line.—The Chautauqua Traction Company, Jamestown, N. Y., announced that, effective on July 1, 1911, it would sell twenty-trip commutation ticket books, containing twenty coupons, each good for transportation of one person between stations named, at the following rates per book: Between Jamestown and Chautauqua, also between intermediate points, \$4; between Jamestown and Mayville, also between intermediate points, \$5. Tickets are good for use on or before Sept. 15, 1911.

Traffic Analysis in Lincoln.—The Lincoln (Neb.) Traction Company has engaged R. W. Harris, traffic service expert with the Wisconsin Railroad Commission, to study and analyze traffic conditions in Lincoln and to report on the most economical routing to meet the present and future demands for service as unconsciously fixed by the traveling public. A substantial start has been made and many interesting characteristics of the lines have already been brought out. It is the object to obtain accurate information regarding the demand for service, the extent of the neutral zone and to measure the resourcefulness of the various territories served by the several lines, as well as the adequacy of the present routing, schedules, etc.

Shorter Day for Women Agents in Chicago.—The following statement has been issued in regard to the plan of the elevated railways of Chicago to meet the requirements of the new law which prohibits women being employed more than ten hours a day: "On and after July 1, 1911, the women employed as ticket agents on the various elevated

railways will be on duty ten hours a day in compliance with the new law. As to the pay which they will receive, it seems only fair that it should be proportioned to the number of hours on duty. The management has under consideration payment on this basis. It further believes that many agents who formerly 'lay off' several days a month will under the new conditions feel no necessity for so doing and therefore their average monthly or yearly earnings will be about the same as heretofore."

Conference with Employees in Philadelphia.—T. E. Mitten, acting chairman of the board of directors of the Philadelphia (Pa.) Rapid Transit Company, held a second conference on June 30, 1911, with representatives of the employees in regard to wages and terms of service. Following the meeting a joint statement was made public as follows: "The meeting resolved itself into an earnest discussion of co-operation between organized labor and the management of the company in bringing about a more efficient operation of the property. Mr. Mitten signified it as being his intention to be absent from the city for a much-needed rest following the directors' meeting of July 17. During the period of his absence, which will be for about four weeks, the matters discussed to-day will be carefully considered and another meeting will be arranged for as soon as practicable after his return."

Through Service Between Warrensburg and Schenectady.—The Public Service Commission of the Second District of New York has approved certain contracts made between the Schenectady Railway, the Hudson Valley Railway, the Electric Express Company, the Delaware & Hudson Company and the United Traction Company for the operation of through cars by the Hudson Valley Railway from Warrensburg to Schenectady, using the tracks of the Schenectady Railway from Saratoga to Ballston Junction, in addition to using the tracks of that company as at present from Ballston Junction to Schenectady. The only opposition to the approval of the contracts which developed was the fact that fear was entertained by some residents along the Hudson Valley Railway that the old Hudson Valley Railway line now used between Saratoga and Ballston Junction might be abandoned and the present 10-cent fare be increased to 15 cents. This objection was overcome, however, when it was explained that before any abandonment can take place the consent of the commission would have to be obtained and the question of the increase in fare is within the control of the commission. The contract in which the express company is interested relates to the carriage of cars of express over the lines of these railroads.

Additional Owl Service in Philadelphia.—The Philadelphia (Pa.) Rapid Transit Company has issued the following notice in regard to increased service at night on its Market Street elevated line and some of the surface lines which connect with the elevated railway: "Commencing Monday, July 10, 1911, trains will be operated all night on the Market Street elevated line. Commencing on the night of July 10 the Haverford Avenue night line (surface cars), now operating at twenty-four-minute intervals, from Haddington and over Market Street to the ferries, will between the hours of 12 o'clock midnight and 5 a. m. run from Haddington to a terminus at Fortieth Street Station on Market Street, where it will make a transfer with the elevated night service by the use of the free transfer. Commencing on the night of Aug. 1, 1911, the Spruce Street night line, which now operates at intervals of thirty-five minutes, from Sixtieth and Spruce Streets, over Chestnut and Walnut Streets, to a terminus at Tenth and Chestnut Streets, will between the hours of 12 o'clock midnight and 5 a. m. run from Sixtieth and Spruce Streets to the Fortieth Street station of the elevated at thirty-minute intervals, where it will make a transfer with the elevated cars by the use of the free transfer. Night line service on the elevated at such frequent intervals, ten minutes apart, should prove so much more popular than the night line surface cars running parallel thereto as to enable the company later to withdraw the service therefrom, and to give night service at more frequent intervals on the surface lines to a transfer connection with the elevated at the City Hall and Fortieth Street stations instead of continuing to operate parallel with the surface lines eastward to the ferries."

Personal Mention

Mr. Ray Taurman has been appointed master mechanic of the Richmond, Interurban and Petersburg divisions of the Virginia Railway & Power Company, Richmond, Va.

Mr. William L. Ransom, a lawyer with an office in New York, has been appointed assistant secretary of the Public Service Commission of the First District of New York.

Mr. W. A. Russell, superintendent of the Elgin & Belvidere Electric Railway and former superintendent of the Public Service Company, of Kenosha, Wis., has resigned, effective Aug. 1, 1911.

Mr. W. L. Arnold has resigned as general manager of the Elgin & Belvidere Electric Railway, Chicago, Ill., to take effect Aug. 1, 1911, on which date he will sail for an extended trip in Europe.

Mr. D. C. Bell has been appointed chief dispatcher and car accountant of the Cedar Rapids & Iowa City Railway, Cedar Rapids, Ia., to succeed Mr. J. A. DuBois, who has accepted a position with the Hartford Life Insurance Company.

Mr. B. W. Slocum, who has been chief engineer of power stations of the Portland Railway, Light & Power Company, Portland, Ore., for the last six years, has been appointed general manager of the Oregon Dry Dock Company, Portland, Ore.

Mr. L. W. Jeffords, who was formerly connected with the office of the auditor of the Metropolitan Street Railway, Kansas City, Mo., has been appointed secretary to Mr. John M. Egan, president of the company, to succeed Mr. J. T. Walmsley, resigned.

Mr. Edward Butts, who has been connected with the Metropolitan Street Railway, Kansas City, Mo., for twenty-five years, most of the time as chief engineer but more recently as assistant to the president, has resigned from the company to engage in private business.

Mr. H. A. Mitchell, who has been secretary and auditor of the Central California Traction Company, San Francisco, Cal., has been appointed general manager of the company to succeed Mr. Samuel L. Naphtaly, who has resigned to become connected with the Great Western Power Company.

Mr. Angus Clark, who has been connected with the Oakland Traction Company and the San Francisco, Oakland & San Jose Consolidated Railway, Oakland, Cal., for four years, has been appointed assistant secretary of the companies to succeed Mr. Frank W. Frost, who has been elected secretary of the companies.

Mr. Fred A. Stowe, who resigned recently as assistant to the president of the Chicago (Ill.) City Railway, has been appointed Chicago traffic agent of the Illinois Traction system. The Illinois Traction system has through freight service with steam railroads into Chicago and Mr. Stowe will devote his energies to increasing the interchange business.

Mr. John H. Marble has been appointed secretary of the Interstate Commerce Commission, Washington, D. C., to succeed Mr. Edward A. Moseley, deceased. Mr. Marble has been connected with the commission for more than five years and has appeared as its attorney in a number of cases. Mr. Marble is now attorney for the committee of the United States Senate which is investigating the election of Mr. William Lorimer as Senator from Illinois.

Mr. Sydney Alfred Williams has been appointed secretary to Mr. J. Sergeant Cram, who was recently appointed a member of the Public Service Commission of the First District of New York. Mr. Williams was graduated from the New York Law School in 1906. He was for a time managing clerk in the law office of Mr. Walter C. Shoup, of New York, and then became executive clerk to Borough President Ahearn.

Mr. John N. Shannahan, formerly vice-president and general manager Washington, Baltimore & Annapolis Railway, was tendered a dinner in New York by a number of friends on July 6 to celebrate his change of residence to that city. The dinner was given in one of the private dining rooms at Rector's Hotel, and about fifty were present. Mr. S. W.

Trawick acted as toastmaster. On July 1 Mr. Shannahan assumed his duties with the operating department of J. G. White & Company, Inc.

Mr. E. E. Downs, until recently general manager for the receivers of the Chicago & Milwaukee Electric Railway, Chicago, Ill., has been appointed general manager of the Elgin & Belvidere Electric Railway, Chicago, Ill., to succeed Mr. W. L. Arnold, general manager, and W. A. Russell, superintendent, whose resignations are announced elsewhere in this column. A biography and a portrait of Mr. Downs were published in the *ELECTRIC RAILWAY JOURNAL* of May 21, 1910.

Mr. Mason B. Starring, president of the Northwestern Elevated Railroad, Chicago, Ill., since 1907, has been elected president of the Chicago & Oak Park Elevated Railroad to succeed the late Clarence A. Knight. Announcement of Mr. Starring's election was made July 11, 1911. Mr. Starring was born and educated in Chicago and has been in the railway business since early youth. He began his career in the operating department of the Chicago, Burlington & Quincy Railroad and was also connected with the Pennsylvania Railroad. In 1888 he became connected with the Chicago City Railway as a clerk. He was subsequently transferred to the office of Judge J. S. Grinnell, general counsel of the company, and in 1894 was made assistant general counsel. On May 12, 1904, he was made general manager of the company. Later he was elected vice-president of the company.

Mr. Milan V. Ayres has resigned as electrical and mechanical engineer of the Boston & Worcester Street Railway, Boston, Mass., to undertake the creation of a department of scientific management for the Rockland Light & Power Company, Nyack, N. Y. He will enter upon his new duties July 17. Mr. Ayres has been connected with the Boston & Worcester Street Railway since the fall of 1902, when the road was under construction. He was formerly with the General Electric Company at Schenectady. He is a graduate of the Newton public schools and of the Massachusetts Institute of Technology. Mr. Ayres has concerned himself for some time largely with the study of power problems, especially the reduction of car weights, and has contributed articles on this subject to the *ELECTRIC RAILWAY JOURNAL* and to the *Proceedings* of the Engineering Association. He is chairman of the equipment committee of the American Electric Railway Engineering Association and will continue his work with this committee until after the convention of the American Electric Railway Association in Atlantic City in October, 1911.

Mr. John A. Cleveland, whose appointment as general manager of the public utilities in Saginaw and Bay City, Mich., was noted in the *ELECTRIC RAILWAY JOURNAL* of July 1, 1911, is thirty-one years

old. He was graduated from Williams College in 1901 with the degree A. B., and from Cornell University in 1904 with the degree E. E. He became connected with the Rochester Railway & Light Company, Rochester, N. Y., serving the company from July, 1904, to May, 1906, as electrical engineer and as commercial engineer in the sales department. In May, 1906, he entered the employ of the Saginaw Power Company as superintendent in charge of



John A. Cleveland

new business and the sales department and continued in these capacities until September, 1909, when he was appointed local manager of the Bay City Gas Company, Bay City Power Company and the Bay City division of the Saginaw-Bay City Railway. In June, 1911, Mr. Cleveland was appointed general manager of the Saginaw-Bay City Railway, the Bay City Gas Company, the Bay City Power Company, the Saginaw City Gas Company and the Saginaw Power Company.

Construction News

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

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

RECENT INCORPORATIONS

***Waycross Street & Suburban Railway, Waycross, Ga.**—Application for a charter has been made in Georgia by this company to build a 30-mile electric railway to connect Hebardville, Deenwood, Winona Park, Blackshear, Waresboro and Waycross. Capital stock, \$500,000. Incorporators: L. J. Cooper, A. M. Knight, J. L. Walker, Dan Lott, J. S. Williams, J. M. Cox, George W. Deen, T. H. Calhoun, L. A. Wilson, John W. Bennett and W. W. Lambdin.

***St. Louis & Jennings Railway, St. Louis, Mo.**—Incorporated in Missouri to build a 1-mile electric railway from the end of the Union-Florissant line to West Walnut Manor in St. Louis. Capital stock, \$15,000. Directors: David Leahy, Richard J. Baldwin, Frank J. Steiner, Philip A. Smith and Henry T. Woodward.

***Ardmore, Duncan & Lawton Railway, Ardmore, Okla.**—Incorporated in Oklahoma to build a 100-mile electric or steam railway from Ardmore northwest through Duncan to Lawton. Capital stock, \$3,000,000.

Lebanon & Campbelltown Street Railway, Lebanon, Pa.—Application for a charter will be made on July 25 in Pennsylvania by this company to build an electric railway between Campbelltown and Lebanon, via South Londonderry, South Annville and North Cornwall. Incorporators: M. S. Hershey, J. B. Leithiser, John B. Snyder, S. C. Stecher and F. B. Snavely. [E. R. J., Feb. 18, '11.]

***Story Electric Company, Tamaqua, Pa.**—Incorporated in Pennsylvania to build electric railway through Schuylkill County to connect Tamaqua, Rush and McDoo. Capital stock, \$10,000.

***Ft. Worth (Tex.), Southern Traction Company.**—Incorporated in Texas to build an electric railway between Ft. Worth and Cleburne. Capital stock, \$1,500,000. Incorporators: G. H. Clifford, W. C. Forbes and W. A. Hanger, all of Ft. Worth.

***Morgantown (W. Va.) Interurban Railway.**—Chartered in West Virginia to build an electric railway between Fairmont and Morgantown, W. Va., and Marion and Waynesburg, Pa. Capital stock, \$25,000. Incorporators: Joseph McDermott, Harry R. Warfield, manager of the Union Utilities Company, and John A. Purinton.

FRANCHISES

Mobile, Ala.—The Mobile Light & Railroad Company has asked the City Council for a franchise to extend its tracks in Mobile.

New Westminster, B. C.—The British Columbia Electric Railway has asked the City Council for a franchise to extend its tracks in New Westminster to the Fraser River mills.

Los Angeles, Cal.—The Pacific Electric Railway, Los Angeles, has received permission from the Board of Public Works to use the municipal railway tracks to the municipal wharves at the harbor of Los Angeles.

Redwood City, Cal.—Edward S. Fitzpatrick has received a franchise from the Board of Trustees to build an electric railway from Redwood City to Woodside, a distance of about 6 miles. [E. R. J., June 3, '11.]

San Diego, Cal.—The San Diego Electric Railway has asked the Common Council for a franchise to extend its tracks in San Diego.

San José, Cal.—The Peninsular Railway has received five extensions of franchises from the Board of Supervisors to build 12 miles of new track in various parts of Santa Clara County.

Oakland, Cal.—The Southern Pacific Company has asked the City Council for a franchise to electrify its lines east of Fallon Street to the boundary line of Oakland.

Woodland, Cal.—The Vallejo & Northern Railway, Vallejo, has received a franchise from the City Trustees to extend its line on Main Street from the eastern to the

western town limits of Woodland. [E. R. J., June 24, '11.]

***Waycross, Ga.**—The Waycross Street & Suburban Railway has received a franchise from the City Council to build an electric railway in Waycross. This is part of a plan to build a 30-mile railway to connect Deenwood, Hebardville, Waresboro, Blackshear and Waycross. L. J. Cooper is interested.

East St. Louis, Ill.—The Alton & Southern Railroad, East St. Louis, has asked the City Council for a franchise to extend its tracks on certain streets in East St. Louis and to connect with the St. Louis & Belleville Electric Railway. C. B. Fox, East St. Louis, is interested. [E. R. J., July 9, '11.]

Webster City, Ia.—The Fort Dodge, Des Moines & Southern Railroad, Fort Dodge, has asked the City Council for a franchise in Webster City.

Shelbyville, Ky.—The Louisville & Interurban Railway, Louisville, has received a franchise from the Town Council over the main street in Shelbyville.

Takoma Park, Md.—The Baltimore & Washington Transit Company, Washington, has received a thirty-five-year franchise from the Town Council in Takoma Park to extend its tracks from the District line and Carroll Avenue to the Washington Sanatorium on the Maryland side.

Inver Grove, Minn.—The St. Paul Southern Electric Railway, St. Paul, has received a franchise from the Council in Inver Grove. [E. R. J., June 10, '11.]

***St. Louis, Mo.**—The St. Louis & Jennings Railway has asked the Municipal Assembly for a franchise to build a 1-mile line from the end of the Union-Florissant line to West Walnut Manor in St. Louis.

Middleport, N. Y.—The Buffalo, Lockport & Rochester Railway, Rochester, has asked the Village Board of Trustees for a franchise to extend its lines in Middleport.

Salem, Ore.—The Portland Railway, Light & Power Company has received a franchise from the City Council to extend its lines on Nebraska Street and Belmont Street, in Salem.

Ellwood City, Pa.—The Beaver Falls, Koppel & New Castle Street Railway has received a franchise from the City Council in Ellwood City. This is part of a plan to build an electric railway between New Castle, Koppel, Ellwood City and Beaver Falls. J. S. Herron is interested. [E. R. J., June 24, '11.]

Irwin, Pa.—The Pittsburgh, McKeesport & Greensburg Railway, McKeesport, has received a franchise from the City Council to construct a line on Fourth Street, from Main Street to the west boundary of Irwin. Connection with the Pittsburgh Railways Company will be made at Trafford.

Chattanooga, Tenn.—The Chattanooga Railway & Light Company has asked the Board of Commissioners for a franchise to extend its tracks on Highland Park Avenue and Vance Avenue, in Chattanooga.

Memphis, Tenn.—The Memphis Street Railway has received a new franchise from the City Commission to build a crosstown line in Memphis.

***Brownsville, Tex.**—J. C. deBruin, Brownsville, has asked the City Council for a franchise in Brownsville.

Wenatchee, Wash.—The Wenatchee Traction Company has received an electric railway franchise in Wenatchee. Louis W. Pratt, president. [E. R. J., June 24, '11.]

Poynette, Wis.—The Chicago & Wisconsin Valley Railroad, Madison, has received a franchise from the Village Board in Poynette.

TRACK AND ROADWAY

San Francisco, Vallejo & Napa Valley Railroad, Napa, Cal.—Construction has been begun by this company on its extension from St. Helena to Calistoga. It is also building a new bridge across York Creek at the terminus of the line at St. Helena.

Oakland (Cal.) Traction Company.—Preliminary work has been done and ties are being laid by this company on its 1½-mile extension in San Leandro from East Fourteenth Street to the foothills.

San José (Cal.) Railways.—Construction has been begun by this company on its new 7-mile line to Alum Rock Park, via Berryessa.

Lake Weir, Ocala & Silver Springs Suburban Railroad, Ocala, Fla.—D. S. Woodrow, Ocala, writes that as yet the plans of this company to build an electric railway between Lake Weir, Ocala and Silver Springs are in a preliminary stage. [E. R. J., June 24, '11.]

Fairburn & Atlanta Railway & Electric Company, Fairmont, Ga.—This company has completed and placed in operation its 10½-mile gasoline motor line between Fairburn, Atlanta, Union City and College Park.

***Rockmart, Ga.**—J. S. Davitte, Rockmart, is reported to be making preliminary arrangements to build a 10-mile electric railway extending through Rockmart.

***Nampa, Idaho.**—The right-of-way has been secured and work will be begun soon on the construction of an electric railway between Nampa and Caldwell. W. E. Pierce, Boise, is the promoter of this line.

Cicero & Southwestern Railway, Chicago, Ill.—This company has been organized to build an electric railway in the western suburbs of Chicago. Capital stock, \$200,000. Franchises will be asked for at once through the towns through which it will extend. Officers: Frank Hunt, president; William H. Sweet, secretary, and Howard W. Hayes, attorney. [E. R. J., June 10, '11.]

Chicago, Waukegan & Fox Lake Traction Company, Chicago, Ill.—This company advises that work will be begun within ninety days on the construction of its interurban railway to connect Waukegan, Fox Lake and Woodstock. Gasoline motor cars will be used. Capital stock authorized, \$1,500,000. Capital stock issued, \$275,000. Officers: W. P. MacCracken, Chicago, president; Peter B. Olsen, vice-president; Charles A. Spenny, 709 Tacoma Building, Chicago, secretary and general manager; I. D. Stevens, treasurer, and L. C. Roberts, Chicago, chief engineer. [E. R. J., July 8, '11.]

***Galena, Ill.**—The Galena Commercial Club is considering plans to build a 14-mile interurban railway between Sinsinawa Mound, Hazel Green and Galena.

Alton, Jacksonville & Peoria Railway, Whitehall, Ill.—The construction has been begun by this company on its extension from Godfrey to Jerseyville.

Gary & Southern Traction Company, Crown Point, Ind.—It is said to be the intention of this company to extend its line to Cedar Lake and Lowell, and eventually to Kankakee.

Indianapolis, Chicago & Meridian Railway, Indianapolis, Ind.—It is reported that bids will soon be asked for by this company to build its electric railway to connect Indianapolis, Sheridan, Flora, Monticello, Francisville, Hammond and Warsaw. M. J. Mooreland, secretary. [E. R. J., July 8, '11.]

Kokomo, Frankfort & Western Railway, Kokomo, Ind.—W. H. Schott & Company, Chicago, Ill., have been awarded the contract by this company to build the 26-mile railway to connect Middletown, Russiaville, Michigantown and Forest. The power house and repair shops will be located at Kokomo. Officers: George J. Marott, Indianapolis, Ind., president; T. C. McReynolds, Kokomo, secretary and general manager. [E. R. J., June 5, '11.]

Indianapolis, New Castle & Toledo Railway, New Castle, Ind.—This company will award contracts in the near future for the construction of its extension from New Castle to Muncie.

Iowa City (Ia.) Electric Railway.—This company advises that it has under construction local lines in Iowa City. It has completed and placed in operation about 3 miles of track in Iowa City. The company operates five motor cars and purchases its power from the Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids. J. O. Schulze, Iowa City, general manager. [E. R. J., Dec. 31, '11.]

Iowa Traction Company, Oskaloosa, Ia.—C. E. Coon & Company, Omaha, have been awarded a contract by this company for grading its 10-mile railway between Oskaloosa, Barnes City, Montezuma, Malcom, Tama, Toledo, Traer,

Eagle Center and Waterloo. George E. Wodehouse, Oskaloosa, president. [E. R. J., Nov. 26, '11.]

Boston & Northern Street Railway, Boston, Mass.—Plans are under consideration by this company to build an extension from the bridge in Groveland through School Street to Georgetown.

Oak Bluffs (Mass.) Street Railway.—This company expects to purchase rail joints for about 1000 ft. of new track.

Berkshire Street Railway, Pittsfield, Mass.—This company placed in operation on July 3 its extension from Great Barrington to Ashley Falls.

Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass.—Surveys are being made by this company on its extension from Colrain to Wilmington, Vt.

Springfield (Mass.) Street Railway.—Work has been begun by this company on an extension of the Indian Orchard line in Springfield to Ludlow. The company will also build two other extensions this summer; one will be in Chicopee and the other will be along the south bank of the Mill River in Springfield.

St. Paul Southern Electric Railway, St. Paul, Minn.—Contracts have been awarded by this company to the Hoy, Elzy Company for the construction of its line between Inver Grove and Hastings. Work will be begun within thirty days. The final route has been settled. The cars will come into St. Paul from Inver Grove over the Twin City Rapid Transit Company's tracks. From Inver Grove it will extend on the west side of the Mississippi River direct to Hastings. This will obviate the necessity of building a new bridge at Hastings. It is reported that negotiations are also under way for the projection of this line to St. Paul Park, Newport and Langdon. When completed it will connect St. Paul, Hastings, Red Wing, Fontenac, Lake City, Mankato, Inver Grove and Faribault. [E. R. J., June 10, '11.]

United Railways, St. Louis, Mo.—The reconstruction of 25 miles of track is being done by this company in St. Louis.

Helena Light & Railway Company, Helena, Mont.—This company has about finished its Cherry Street extension in Helena.

Omaha, Sioux City & Northern Railway, Omaha, Neb.—Preliminary surveys have been completed and contracts are now being made for right-of-way by this company to build an electric railway from Omaha to Sioux City, on the west side of the river. B. M. McCue, Garden City, is interested. [E. R. J., July 8, '11.]

Chautauqua Traction Company, Jamestown, N. Y.—Work has been begun by this company double tracking some of its lines in Jamestown and rebuilding the old Lakewood Railway from the Jamestown city line to the underground crossing of the Erie Railway.

***Rexford, N. Y.**—A meeting for the purpose of forming a permanent organization, the object of which will be to build a 22-mile railway between Rexford and Watertown, has been held and the following officers elected: John Richmond, Waterford, president; C. B. Hawley, Halfmoon, vice-president; James W. Dickey, Halfmoon, secretary, and A. C. Newton, Crescent, treasurer.

Buffalo, Lockport & Rochester Railway, Rochester, N. Y.—Plans are being considered by this company to build an extension from its Church Street line, in Middleport, north on Harland Street to Main Street, over the Erie Canal to Mill, and west with spurs to several mills and factories.

***Crescent-Halfmoon Railway, Troy, N. Y.**—This company has been formed to build an electric railway between Rexford Flats and Cohoes.

Elmira, Corning & Waverly Railroad, Waverly, N. Y.—Track has been laid for the Corning end of this railway. Work of wiring has been begun.

Piedmont Railway & Electric Company, Burlington, N. C.—Grading has been completed and construction has been begun by this company on its line to connect Burlington, Graham, Haw River, Big Falls, Carolina and Glencoe. J. W. Murray, Burlington, is interested. [E. R. J., Jan. 3, '11.]

Grand Forks (N. D.) Street Railway.—Surveys have been completed and the necessary capital secured by this com-

pany to build its 1-mile extension from Grand Forks to East Grand Forks, Minn.

***Riverport, N. S.**—T. G. Nichol, Mahone Bay, plans to construct a 12-mile electric railway between Lunenburg and Riverport, with a spur to Park Creek. Surveys are being made.

Alliance-Akron Railroad, Alliance, Ohio.—About 6 miles of grading has been done and bonds to the amount of \$800,000 have been issued by this company to cover the cost of the construction of its 26-mile electric railway between Alliance and Akron via Tallmadge, Mogadore, Marlboro, New Baltimore, Brimfield and Rootstown. A. Swinehart, Akron, president. [E. R. J., April 22, '11.]

Columbus, Urbano & Western Electric Railway, Columbus, Ohio.—The appropriation of \$50,000 for building a branch from the line of this company to the Girls' Industrial Home a few miles from Delaware has been approved. The company will have to complete its line from Fishingers to Dublin before the extension can be built, however. It is said that work will be commenced within a short time both on the extension to Dublin and on this branch.

Dayton (Ohio) Street Railway.—Plans are being made by this company to construct an extension from the loop on Salem Avenue, in Dayton, about 1½ miles north of Dayton, to Harrison.

Portland Railway, Light & Power Company, Portland, Ore.—This company is relaying its double track with heavy steel rails on nearly all its East Side lines in Portland.

Central Pennsylvania Traction Company, Harrisburg, Pa.—An extension is being built by this company of its Second Street line, in Harrisburg, to the Harrisburg Academy at Riverside. The company also contemplates the extension of its Ft. Hunter line to Dauphin.

***Owego, Pa.**—Henry Gibbs and James J. Walker, Owego; J. C. Tripp, Warren Center, and associates are making preliminary arrangements to build a 22-mile electric railway to connect Owego and LeRaysville via Warrenham, Warren Center, Wapaseening Creek, South Warren, Pottersville and Ellis Creek Valley.

Allegheny & Northwestern Street Railway, Pittsburgh, Pa.—The McComb Construction Company, Olean, N. Y., has been awarded the contract by this company to build the 27-mile gasoline motor line between Evans City, Mars and Harmarville. John Schaffer, Butler, is interested. [E. R. J., June 10, '11.]

Texas Traction Company, Dallas, Tex.—This company advises that it will begin construction at once on 2½ miles of track in Dallas. It is expected to extend this line to Bonham and McKinney. The company's power house and repair shops will be located at McKinney and five cars will be operated. J. H. Strickland, Dallas, president. [E. R. J., July 1, '11.]

Northern Texas Traction Company, Ft. Worth, Tex.—Construction has been begun by this company on the extension from Forest Park to the Texas Christian University.

Marshall (Tex.) Traction Company.—Arrangements have been made by this company to extend its line in North Marshall.

San Benito (Tex.) Interurban Railway.—About 30 miles of new track will be constructed by this company upon the land of the San Benito Land & Water Company.

***Mercer Electric Railway, Athens, W. Va.**—It is reported that this company will soon be in the market for 56-lb. rails to build 7 miles of line to connect Athens and Princeton. R. G. Meador, Athens, is interested.

Fairmont & Clarksburg Traction Company, Fairmont, W. Va.—Work is being rushed by this company on its new lines and improvements are being made at different points on its entire system.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—Plans are being considered by this company to build a new carhouse to be located in one of the small towns south of Los Angeles.

Illinois Traction System, Champaign, Ill.—This company will build a temporary passenger station at Lucas Street

and High Street, in St. Louis. The structure will be two stories high, 120 ft. x 40 ft., and of brick construction. The company is considering plans to build a large new passenger station in St. Louis.

Orange County Traction Company, Newburgh, N. Y.—This company expects to build a new carhouse at Newburgh.

POWER HOUSES AND SUBSTATIONS

Bristol & Plainville Tramway, Bristol, Conn.—This company has placed an order with the General Electric Company covering a complete power plant equipment which includes two 937-kva horizontal turbine generator units, switchboard, rotary converters, motor-driven and turbine-driven exciters, etc. The switchboard contains twenty-five panels, forming one main station board and one substation board. The main station switchboard will be a.c. and will control two 937-kva generators and two 25-kw exciters provided with voltage regulators. The substation switchboard, which will control three 300-kw, 600-volt rotary converters, consists of three a.c. and three d.c. rotary converter panels and three a.c. rotary converter starting panels. Provision is also made for two panels controlling single-circuit power feeders and five panels controlling single-circuit railway feeders.

New York, New Haven & Hartford Railroad, Stamford, Conn.—This company has placed an order with the Bigelow Company, New Haven, Conn., for twelve 625-hp Bigelow-Hornsby water-tube boilers for its new power station at Cos Cob, Conn.

Alton, Jacksonville & Peoria Railway, Whitehall, Ill.—This company will soon build a new power house on Piasa Creek about 9 miles beyond Alton.

Indianapolis, Chicago & Meridian Railway, Indianapolis, Ind.—This company will soon ask for bids for the construction of its new power house in Monticello.

Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind.—This company has placed an order with the General Electric Company for two 300-kw rotary converters, fifteen 100-kva transformers and a switchboard. The rotary converter and six of the transformers will be installed in the Maywood substation. Six of the transformers will be installed in the Mooresville substation and three in the Martinsville substation. The transformers are oil-cooled, 25-cycle units, 33,000 volts primary and 300 volts secondary, and are provided with 50 per cent starting taps on the secondary. The switchboard will be installed in the Maywood substation and will control the 33,000-volt incoming lines, the bank of step-down transformers and the rotary converter. It will consist of an a.c. rotary converter panel, two d.c. rotary converter panels, rotary converter starting panel, and a blank a.c. rotary converter panel. A triple pole, automatic K-10 oil-break switch will protect the transformers. The order also included 33,000-volt, three-phase aluminum-cell lightning arresters with horn-gap disconnecting switches.

Des Moines (Ia.) City Railway.—This company has ordered a portable substation for its Grand View line to be delivered in Des Moines by Aug. 1.

Morris County Traction Company, Morristown, N. J.—This company has begun work on its new power plant to be erected in Chatham.

United Traction Company, Albany, N. Y.—This company is considering plans to construct a new transformer station near Quail Street in Albany.

Orange County Traction Company, Newburgh, N. Y.—This company will install a new rotary converter and switchboard at its power house in Newburgh.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Power Company, Akron, Ohio, has awarded a contract to the Carmichael Construction Company to construct a reinforced concrete dam 500 ft. long and 60 ft. high across the Cuyahoga River at Cuyahoga Falls to operate a generating plant of 2000 hp. A steam plant of 18,000 hp. is being built above the site of the dam. This company will furnish power for the railroad and lighting systems of the Northern Ohio Traction & Light Company.

Wheeling (W. Va.) Traction Company.—This company is improving its power house in Wheeling.

Manufactures & Supplies

ROLLING STOCK

Cleveland (Ohio) Railway will probably order fifty or sixty new cars.

Texas Traction Company, Dallas, Tex., has ordered two 20-ft. 8-in. closed cars mounted on Brill 21-E trucks from the Danville Car Company.

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has ordered three 40-ft. freight trailer cars from the Cincinnati Car Company.

Woodstock & Sycamore Traction Company, Sycamore, Ill., has ordered a standard 55-ft. gasoline motor car from the McKeen Motor Car Company.

Sherbrooke (Que.) Street Railway has ordered two 30-ft. single-truck pay-as-you-enter car bodies mounted on Brill trucks from the Ottawa Car Company, Ltd.

Columbus Railway & Light Company, Columbus, Ohio, has ordered twelve 28-ft. 8 5/16-in. pay-as-you-enter car bodies from the G. C. Kuhlman Car Company.

Philadelphia (Pa.) Rapid Transit Company has ordered thirty 49-ft. 7 1/4-in. steel elevated motor cars complete with Brill 27-MCB-3 trucks from The J. G. Brill Company.

Oakland (Cal.) Traction Company has ordered ten equipments of type HL non-automatic, unit-switch control from the Westinghouse Electric & Manufacturing Company.

Muskegon Traction & Lighting Company, Muskegon, Mich., has ordered one 33-ft. 4-in. semi-convertible car body mounted on Brill 27-G trucks from the G. C. Kuhlman Car Company.

Springfield (Mo.) Traction Company has ordered six double equipments of No. 323 railway motors with type K-10-A control from the Westinghouse Electric & Manufacturing Company.

Toledo & Indiana Railroad, Toledo, Ohio, has just put into service a new locomotive weighing forty tons, which is equipped with four Westinghouse No. 304 interpole motors rated at 90 hp each on 600 volts.

San Francisco, Oakland & San Jose Railroad, San Francisco, Cal., has ordered twenty-five double equipments of No. 302 railway motors and type M control from the Westinghouse Electric & Manufacturing Company.

International Railway, Buffalo, N. Y., has ordered sixty semi-convertible near-side cars 45 ft. 2 1/2 in. long over all, mounted on Brill 30-E truck, and one 49-ft. 6-in. freight and utility motor work car body from The J. G. Brill Company.

Piedmont Traction Company, Charlotte, N. C., has ordered a quadruple equipment of No. 308B-5 railway motors and special type HL non-automatic control from the Westinghouse Electric & Manufacturing Company. These motors are insulated for operation on 1500 volts.

Greenville, Spartanburg & Anderson Railway, Greenville, S. C., has ordered five quadruple equipments of No. 308-B-5 railway motors for operation on 1500 volts with special type HL non-automatic, unit-switch control from the Westinghouse Electric & Manufacturing Company.

Boston (Mass.) Elevated Railway, noted in the ELECTRIC RAILWAY JOURNAL of July 1, 1911, as having issued specifications for fifty surface cars, has ordered twenty-five cars from the St. Louis Car Company through Wendell & MacDuffie Company, New York, and the same number from the Osgood-Bradley Car Company.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has ordered ten 28-ft. double-truck cars from The J. G. Brill Company. These cars are to have large platforms and will be 38 ft. 10 in. long over all, but they will not be equipped for prepayment operation. They will have Westinghouse air brakes, two GE-210 motors and Brill maximum traction trucks.

TRADE NOTES

Grip Nut Company, Chicago, Ill., has appointed W. G. Willcoxson sales manager with headquarters in the Old Colony Building, Chicago.

Hale & Kilburn Manufacturing Company, Philadelphia, Pa., has moved its Chicago office from the Fisher Building to the McCormick Building.

Standard Underground Cable Company, Pittsburgh, Pa., will establish a Canadian branch in Hamilton, Ont. The plant will cost, it is estimated, \$500,000.

Bontempi Rust-Proofing Company, New York, N. Y., has leased a plot of land, 70 ft. x 142 ft., in Bridgeport, Conn., on which it will erect furnaces for commercial purposes.

Ball & Wood Company, Elizabeth, N. J., manufacturers of stationary engines, has been placed in the hands of former Judge J. Kearny Rice, of New Brunswick, as receiver, by Judge Rehlstab in the United States District Court at Trenton.

Lord Electric Company, New York, N. Y., has moved from 213 West Fortieth Street to its new offices at 105 West Fortieth Street, giving up the entire building at the former address to the Lord Manufacturing Company, which will occupy these quarters until its new factory is completed next spring.

Railway Roller Bearing Company, Syracuse, N. Y., has equipped with rollway journal boxes two cars with Brill 39-E trucks for the Frankford, Tacony & Holmesburg Street Railway, Philadelphia. These cars are equipped with motors of 25 per cent less rated capacity than required for cars with plain bearings.

Baldwin Locomotive Works, Philadelphia, Pa., has appointed John P. Sykes general superintendent to succeed S. M. Vauclain, who held that position twenty-six years and who has now become vice-president. Mr. Sykes was formerly assistant general superintendent and has been connected with the company in various capacities since 1879.

Sangamo Electric Company, Chicago, Ill., has completed a new building, 160 ft. x 40 ft. x 42 ft., two stories high, of steel, brick and concrete construction. The lower floor contains the shipping department, instrument testing room, generator room, machine and tool room and pattern shop. On the upper floor are located the assembling and general testing rooms, office and drafting room. The new building is connected by a passageway on the second floor with the main building, which is 180 ft. x 30 ft.

Sprague Electric Works, New York, N. Y., has appointed Frank W. Hall manager of hoist sales. His headquarters after July 15 will be at the New York office. Mr. Hall was formerly manager of the Philadelphia office. James A. Clifford, manager of the Baltimore office, has been appointed to succeed Mr. Hall as manager of the Philadelphia office. The Baltimore office will be continued as in the past under Mr. Clifford's direction, but as subsidiary to the Philadelphia office and with Henry S. Patterson in charge.

General Electric Company, Schenectady, N. Y., has sold to the Union Switch & Signal Company all of its patents relating to railway signaling, together with its stock and manufacturing equipment in this line of work. The Union Switch & Signal Company is now prepared to furnish the signaling apparatus heretofore supplied by the General Electric Company. While this sale does not include accessory apparatus such as switchboards, rectifiers, motor-generator sets, generators, etc., the Union Switch & Signal Company will now be able to offer General Electric accessory appliances to supplement effectively its lines of signal material when making complete signal installations.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the formation of the Wagner Electric Manufacturing Company, Limited, of Canada, under a Dominion charter, and with a capital stock of \$50,000, full paid. The Canadian corporation becomes the exclusive Canadian licensee under patents owned and controlled by the St. Louis company. Alfred Collyer, for many years representative of Wagner interests in Canada, has been appointed manager of sales of the new company. The officers of the new company, besides Mr. Collyer, are S. M. Dodd, president; W. A. Layman, vice-president and general manager; W. S. Thomas, treasurer. The previous headquarters of the Wagner Electric Manufacturing Company in the Bell Telephone Building, Montreal, becomes the headquarters of the new company.

J. G. White & Company, Ltd., London, held their annual meeting June 29. Mr. White presided. The report showed a net profit for the year of £91,466, against £64,801 for last year. The report stated that the investments fall into three classes, namely, associated companies, syndicates and general investments. Those of the first class are practically fixed and permanent and include a controlling interest in the Building Construction Company, Ltd., which has built a number of important buildings in London recently. The syndicate class of investments are usually taken in connection with efforts to secure new business, either financial or engineering. The general investments are the securities taken in connection with contracts or promotions, or are purchased with the expectation of selling at a profit. During the ten and one-half years of the company's life it has pursued a very conservative policy in regard to dividends. It has paid out in dividends £160,708 and has retained in the business out of profits £182,787. The chairman then said: "Had all the company's profits for the last five years been distributed to shareholders, leaving the reserve at about £57,000, the preference shareholders would have received, including the proposed dividends for July 1 next, a total of 60 per cent instead of 45 per cent, and the ordinary shareholders would have received 302 per cent instead of 95 per cent." The chairman then recommended a distribution, including the interim dividends of 5 per cent paid Jan. 1, of 12 per cent on the preferred and ordinary shares, with an extra dividend of 50 per cent on the ordinary shares, making the total on the ordinary shares 62 per cent for the year.

American Car & Foundry Company, New York, N. Y., reports total earnings from all sources for the year ended April 30, 1911, as \$6,240,324, as compared with \$5,725,098 for the previous year. The net earnings for the year ended April 30, 1911, were \$4,234,789, as compared with \$4,089,478 for the previous year. The surplus for the year ended April 30, 1911, after paying dividends at the rate of 7 per cent on the preferred stock, dividends on the common stock and charging up a reserve of \$750,000 for general overhauling, improvements and maintenance, was \$784,789, as compared with \$1,389,478 for the previous year. Fred H. Eaton, president of the company, says that the demands of the railroads for new equipment were in the aggregate much less for the fiscal year 1910-11 than for 1909-10, and that because of this orders were taken on an even more strongly competitive basis than heretofore and consequently on a lower margin of profit. The construction of the proposed additional steel-car plant has not yet begun because the conditions which prevail have not yet favored such action. The additional shop at St. Charles has been completed and the company's all-steel passenger-car plant at that place is practically completed. For this work and for additions to the company's plants at Berwick, Detroit, Chicago and Milton there was expended from the reserve for additions to steel-car plants the sum of \$434,225. It was deemed prudent to make up in part the depletion of this reserve and \$250,000 of net earnings was appropriated to it, making the total to be carried forward \$1,277,795, as against \$1,462,020 in this reserve on May 1, 1910. From the reserve for general overhauling and improvements and maintenance, amounting to \$628,167, there was expended during the year \$349,561 for installing new machines and improvements.

ADVERTISING LITERATURE

United States Electric Company, New York, N. Y., has issued Bulletin No. 502, which contains suggested rules for telephone train dispatching.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., is mailing a bulletin in which dispatchers' signals for electric interurban railroads are described and illustrated.

Railway Improvement Company, New York, N. Y., is mailing a binder containing reprints of several commendatory letters from users of the company's coasting time recorders.

Carnegie Steel Company, Pittsburgh, Pa., has printed a pamphlet entitled "Furnace Slags in Concrete," in which are presented the results of a series of tests of blast-furnace slag, in various forms, for use as an ingredient in the making of concrete.