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Of this issue of the ELECTRIC RAILWAY JOURNAL 9000 copies are printed.

Special Cars at Central Electric Meetings

The program for the next meeting of the Central Electric Railway Association, to be held at Detroit, on Aug. 26, includes a paper by F. D. Norviel, Indiana Union Traction Company, on "The Development of Long Distance Passenger and Freight Business." It has been suggested that the time will be an appropriate one for officials of various properties to make the trip from their homes to the meeting place in special cars. At several recent

meetings of the association special cars have been features which have attracted sufficient attention from the daily newspapers and the public to be effective advertising. The possibilities of long-distance travel on interurban lines, where the length of road or connections make it possible, are understood reasonably well by those whose business or pleasure leads them to make periodical trips, but there are many who are not acquainted with the opportunities afforded by electric roads, and their patronage may be secured by advertisement. A special electric car that has carried delegates to a meeting a long distance from their homes is a novelty that has proved to be an attraction not only for outsiders, but also one that stimulates interest in the work of the association.

Rules for Interurban Railways

Elsewhere in this issue will be found the complete revision of the code of interurban rules to be presented at the Denver convention by the committee on interurban rules of the Transportation & Traffic Association. It will be remembered that the committee presented to the association last year a tentative code, which was referred back to it for further consideration. On May 25 a conference was held by the committee in Washington, D. C., and the discussion of the rules at that time resulted in the formulation of a number of radical changes, some of which were discussed editorially in the issues of this paper following the meeting. Several of the rules about which there were wide differences of opinion among those present at the Washington conference were passed for further study by members of the committee, and these rules, together with all the other proposed changes, were carefully considered at a subsequent meeting held in Fort Wayne, Ind., July 27. The revisions printed elsewhere in this week's issue are the present conclusions of the committee. Some of the changes made are comparatively unimportant, but the adoption of 19 and 31 forms of train orders, with the rejection of the coded form of blank, the change in rule 203 relating to trains leaving initial station, the method outlined for the protection of trains proceeding under a flag, and the procedure prescribed for calling the dispatcher when an opposing car has not arrived at a meeting point, are vital.

Throughout all of its work the committee has given the widest publicity to the proposed revision of the rules, and has invited suggestions and criticisms by letter, or in person at its meetings, from operating officials of railway companies and any others who are interested in interurban railway rules. The publication at this time of the changes at present proposed in the code is in line with this policy of publicity, and when the rules are finally adopted at Denver they should represent the best opinion of all who take an interest in interurban railway operation.

Restriction of the Tayler Plan

The attitude of the daily newspapers of Cleveland and the tone of public comment on the disaster to Mayor Johnson's plans in the referendum of last week indicates the general desire for a return to the Tayler ordinance, or a modification thereof. Probably the main features of the Tayler plan would have formed the framework of an ordinance that would have been accepted by the company operating the street railway, notwithstanding some objectionable provisions, if the negotiations had not been discontinued by the Mayor. He and his supporters did all that lay in their power to discredit this plan, in spite of the demand of the public for its adoption. If the Tayler plan, amended or as drawn originally, is brought forward again, a change should be made in the provision of the measure, as drafted, which was designed to restrict the return on the investment represented by the capital stock to 6 per cent annually. No matter how the earnings of the property developed, or what degree of operating efficiency might be attained, the maximum return was to be fixed at this figure. If the property could be made to pay this rate of dividend, either with low fares or the usual prevailing rates, that was all the stockholders could expect. It appears that the real effect of a limitation of that nature would be to destroy the incentive to initiative arising from the hope of profit greater than that which may be obtained by ordinary effort only.

Mountain Railways in Europe and America

One of the features of travel in Switzerland is the large number of mountain railways, steam, cable and electric, which reach almost every coign of vantage for very moderate fares. In fact, throughout Europe, almost every acclivity from which a view can be had and which is at all accessible to the tourist is provided with means by which he can easily gain the summit. Of course, Switzerland is the home of this class of road. There they are the most numerous and longest, and, according to the published returns, they are quite profitable. Thus, during the year of 1907 the Rigibahn, the pioneer of them all, paid 10 per cent; the Wengernalp paid 8 per cent; the Glion-Rochers paid 7 per cent; the Pilatusbahn paid 6½ per cent; the Gornergrat paid 5 per cent, and the Jungfraubahn, still incomplete, 4 per cent. These are the six principal mountain railways in Switzerland. Owing to their unique character, some of the unit figures of cost of construction and receipts of these lines are worth publishing. The Pilatusbahn, being typical of all, can be taken as an example. Its total cost of construction was \$887,121, or about \$216,000 per mile. In all, 143,640 passengers were carried in 1907, and the average fare paid was \$1.17. The gross receipts were about \$21,000 per mile. Of all the lines, that up the Jungfrau has been the most expensive. Up to the end of 1907 \$1,451,462 had been spent in its construction, which has cost practically at the rate of \$400,000 per mile of track.

This satisfactory financial condition often suggests to the American traveler that mountain railways here might be profitable, but a little thought will disclose, we think, that there are not the same opportunities in this country as abroad. The number of visitors to any single mountain re-

sort here, like the Adirondacks or the White Mountains, is very much less than where a small territory is the recreation ground of an area as populous as the Continent of Europe. The season at our Eastern mountain resorts is also much shorter than that in Switzerland, and the altitudes to be ascended are less, so that there is less dependence on transportation lines for reaching the summits. Probably, also, the cost of construction would be considerably greater in this country than in Switzerland. The possibilities are worth considering where the conditions are favorable, but we do not believe there is any very great unoccupied field for mountain railways in this country. The most prominent example in the Eastern States of a mountain railway is that up Mt. Washington, in the White Mountains. This line has been in operation for many years, and, although profitable, has not been a very conspicuous example of financial success. The lack of any considerable number of imitators and the abandonment of one or two other lines in the East do not encourage the construction of similar roads. There are several scenic roads in the Far West, and from appearances they have had better fortune. That up Mt. Lowe, near Los Angeles, and the Pike's Peak line in Colorado carry a goodly number of passengers, and it is said that the latter is to be considerably extended. Another important road of this character is that up Lookout Mountain, near Chattanooga. But it may fairly be said that to insure success a long season is necessary, longer than that which exists in most of our Eastern mountain resorts.

Clerical Work in the Engineering Department

Observation of the amount of clerical work imposed upon the engineering departments of large electric railway and lighting companies prompts the suggestion that here is a possible source of extra expense and reduced divisional efficiency. In the nature of things the technical branch of a public service corporation must keep accurate records of or have immediate access to tests, designs, contracts, specifications and reports; but unless care is taken to dispose of these systematically among the departments most concerned, after a given line of practice has been established, the engineering staff may find itself overwhelmed with papers, and very likely overburdened with routine clerical labor that should be done by less expensive men than compose its personnel. In other words, the primary function of a technical department like the engineer's is advisory, originative and critical, and so far as possible repetitive clerical work should be performed by other branches of the service. There are plenty of things for an engineering department to do besides writing detailed specifications for long-standardized products, copying power station logs from day to day, and in general recording statistics which can be more cheaply prepared where they originate, duplicated if necessary, and then submitted to the department for approval and filing, criticism or other appropriate action.

The best practice tends toward the subdivision of clerical labors by the location of one or more clerks at large power stations, car houses and division superintendents' offices to handle routine matters, leaving the engineering department free to take up the special work which is responsible for its existence. Of course, no hard and fast line can be drawn

here, but if all the clerical work is measured by its value in a routine or a special case, much will be learned. The engineering department can still be held responsible for all specifications if the purchasing agent's staff prepares them in detail, though in cases where wide departures from previous practice are contemplated an exception may fairly be made in favor of their preparation by the technical staff. With the advance in technical knowledge now being gained by the best auditing and purchasing departments, there is no reason why many of the routine clerical matters formerly handled by the engineering division should not be disposed of elsewhere, and without any sacrifice of full and regular review by the technical staff of all conditions of operation which naturally should pass before it.

Securing Right-of-Way

Many volumes have been written upon different phases of electric railway engineering and there is some literature on the conduct of the real estate departments of steam railroad companies, but there is comparatively little information, in published form, as to the proper methods of securing a right-of-way through country districts for proposed electric railways. The reason for this is undoubtedly because this work is usually undertaken by local promoters who have been attracted to the proposition because of its effect on their other interests or because they think it will be profitable. Not having been actively associated with similar undertakings, they often make mistakes which prove embarrassing to the engineers who subsequently have to construct the line, and to the company which has later to operate it.

The three factors principally to be considered in securing a right-of-way of, say, 40 ft. in width, with slopes, are (1) the best engineering line; (2) the line best serving the country and, therefore, the road; and (3) the line of least cost for land. The adjustment of these conditions takes time and tact.

A good right-of-way man is essential, and he should accompany the engineers who make the preliminary survey. Experience has shown that the best way to gain right-of-way is to have the owner of the land sign a simple agreement to deed to the company the necessary ground. To obtain a deed with the owner's signature and that of his married consort, duly acknowledged in legal form, is rarely possible, until the line is staked out. The owner requires the knowledge on the ground by stakes 100 ft. apart of just where his land will be occupied. This engineering accuracy is rarely possible in a preliminary survey, owing to the subsequent changes of line made to suit some other land owner, and any change alters the alignment for a thousand or more feet both ways. Hence, it is best to defer the deed signature for a more certain location on the ground. Of course, the agreement in writing of a land owner to deed a piece of ground is not binding, but the owner usually regards it as such; it is far better than a verbal promise, and it permits the right-of-way agent to close up his work with the least effort.

By traveling with the preliminary survey party, the right-of-way man gains acquaintance with the line, the country and—of greatest importance—with the people. He readily finds out who will be the difficult grantors of land; by gaining the consent of these first, he will find the other grantors

more easily signed. Briefly, the success on right-of-way lies entirely on the man, so no effort should be spared to secure the best, and three-quarters of the country portions of the line should be obtainable free.

It is usually judicious to proceed along the entire road and gain all the free grants before making any intimation of payment, for news of such a proposition travels fast, and after that it is difficult to secure more free grants.

As a rule, it is as easy to gain deeds to property, exempting mineral and perhaps the timber, so as to secure merely an easement, and such a deed is by far a better asset for a company. As a rule, also, it is well to insert at the beginning of the deed a clause that the land will revert to the grantor provided the road is not built within a specified number of years. A demand for this clause is invariably made on right-of-way work, and negotiations will be more quickly completed if it is inserted at the start. The question of what is a fair amount to pay for grants of right-of-way is governed by too many conditions to permit a definite answer. When the line lies through country farming sections, one factor is the way in which the proposed line will cut the property. Twice the local estimate of value per acre is, perhaps, a fair average.

For right-of-way through incorporated towns the principal questions are usually length of franchise, paving and type of rail. Usually the negotiations take months, and can be most quickly concluded by inducing the authorities to appoint a committee, of not more than five, for the conferences between the company and the town. In these cases it is always advisable to secure the confidence of the town attorney or solicitor. His influence is great and, though he is rarely a business man, his decisions on business as well as on legal points are generally final with his associates.

After the preliminary work is concluded the road must be financed. Many propositions go to financiers in such a very crude state that the latter gain no intelligent idea of their value. As a rule, those bankers who entertain railway propositions are most interested in the man who presents them. If his judgment is thought good the proposition will receive respectful attention. Next in order is the manner in which the scheme is compiled, so as readily to bring out all the facts necessary for the banker's attention. In addition to a word picture of a proposition, a copy of each franchise, of the charter and of all agreements bearing on the financing is essential.

The first thought in the banker's mind is the one, "Will it pay?" The answer should be prominently set forth in the report on the proposition, and is chiefly the population per mile and the size of the terminal towns. The character of the country and its industries have much to do with admissible "population per mile." The second thought is: "Will the securities per mile be low enough to market them readily?" Earning capacity, of course, governs, and hard-and-fast rules are impossible. The best way is for promoters to obtain first an opinion from a responsible engineer experienced in this class of work, as to the probable success of the enterprise, before spending the money to place the proposition in banking shape. Moreover, the year's work of preparation of a project will proceed more rapidly if there is fair assurance of ability to find the construction capital on completion of the get-ready work.

POWER IMPROVEMENTS OF THE CONEY ISLAND & BROOKLYN RAILROAD COMPANY

During the past two years the power system of the Coney Island & Brooklyn Railroad Company has undergone a complete transformation. Prior to July 1, 1908, the company had in operation three steam generating stations, with a combined capacity of about 6500 kw, supplying current for the operation of approximately 160 cars. The main plant was located where Ninth Street crosses the Gowanus Canal, was condensing and secured its coal by water. The other two plants, on DeKalb Avenue and Coney Island Avenue, were non-condensing and required the haulage of coal and ashes. All of these plants contained Westinghouse "Kodak" engines and Climax vertical boilers, and the machinery in every case was from 4 to

change. For the last fiscal year, or that ended June 30, 1908, before any of the old plants were shut down, the cost of manufacturing power, including maintenance but no fixed charges, amounted to \$352,440. This was at the rate of 6.3 cents per car-mile operated from this power house, or about 2.2 cents per d.c. kw-hour sent out on the line. For the last six months of the present fiscal year, namely, from Jan. 1 to June 30, 1909, the cost of manufacturing current at the new plant, including maintenance but no fixed charges, has been \$41,922, or at the rate of \$83,844 per year. This corresponds to a cost of 1.8 cents per car-mile operated, or 0.7 cent per d.c. kw-hour sent out on the line. Consequently the saving in cost of operation of the new plant over the old is at the rate of over \$250,000 per year, or approximately 4.5 cents per car-mile, or 1.5 cents per d.c. kw-hour. Perhaps a better idea of the relative importance of this saving can be had when it is stated that for the month of June, 1909, \$3,123 was spent for coal in the new plant, as compared with \$19,419 for June, 1908, in the old plants. Another significant comparison is that in June, 1909, 37 men were employed in the new power house and substations, as against 93 men in the old power houses during June, 1908.

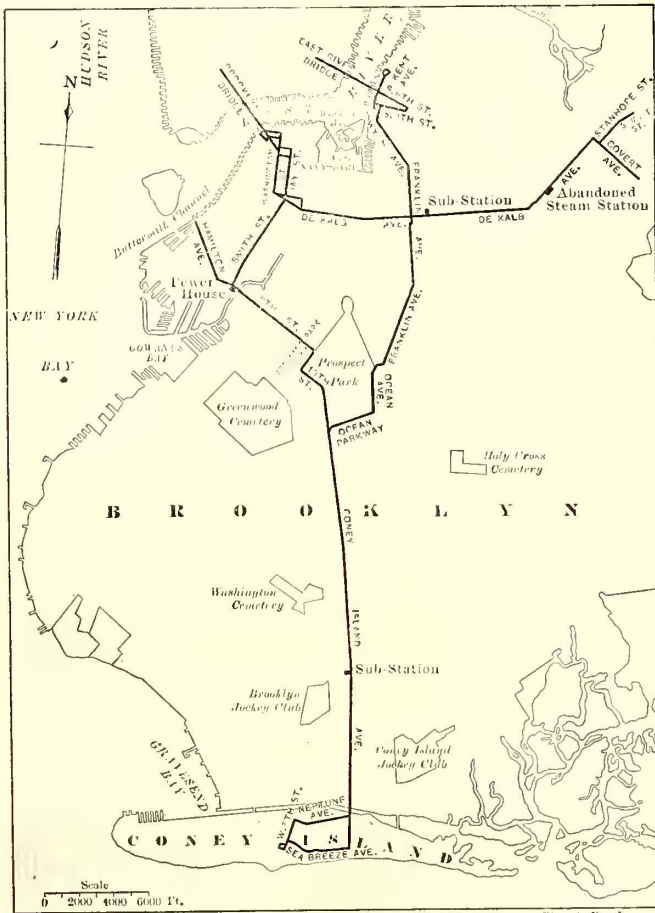
The fixed charges on the new plant, it is believed, will be as low as possible on a plant of this size, inasmuch as its first cost is understood to have been probably lower than any plant of similar size in this vicinity, due to the purchase of the new apparatus and material at exceedingly low prices.

All of this work has been carried out under the direction of Ford, Bacon & Davis, who were engaged in May, 1907, by the company as consulting engineers for the reconstruction of its power system. Before commencing actual work complete reports were prepared by these engineers covering the power capacity required for future operation and estimates of cost of construction. From a study of the transportation records the peak loads and kilowatt-hours output required at the station were calculated and plotted for the years 1907 to 1912, and the size and number of units were selected accordingly. For the generating station it was apparent that two turbines of approximately 3500 kw capacity each (maximum rated capacity) would be needed to carry the load and that spare capacity should be provided in case one of the turbines broke down. The two 800-kw, d.c. units at Smith Street were in fair condition for use at peak loads during days of heavy traffic and if necessary could be reinforced by the five "Kodak" units at the same place. While these "Kodaks" were very uneconomical, it was considered more satisfactory for the present at least to have them for occasional use rather than buy a third turbine and accessories. The consulting engineers recommended that the other steam stations should be entirely dismantled and the apparatus sold.

LOCATION OF POWER PLANT AND SUBSTATIONS

The most favorable site for the power plant from the standpoint of coal delivery and the distributing system was that at Smith and Ninth Streets, on the bank of the Gowanus Canal. Although the water of this canal was not entirely desirable for condensing purposes, it can be used, and in view of the proposed flushing of this waterway, will be more satisfactory in the future.

The first substation was located in the power plant itself. The second was placed at Avenue Q and Coney Island Avenue, on the site of one of the discarded steam plants, as this was near the center of gravity of the



Coney Island & Brooklyn Power Improvements—Map of Lines Showing Location of Power Station and Substations

13 years old. The main station contained, in addition to the five "Kodak" units, two 800-kw compound Corliss engine-driven units.

The new power system of the company was put in operation Nov. 1, 1908, and since that time has consisted of a central power house at Ninth Street and Gowanus Canal, containing two steam turbine units with a total rated capacity of 7000 kw, supplying 11,000-volt alternating current to rotary converters contained in substations, one of which is located at the power house, one on Sanford Street near DeKalb Avenue, and one on Coney Island Avenue at King's Highway, through high-tension underground distribution system. These two turbine units, with six water-tube boilers, are to-day doing the work which was formerly required of 19 engine units and 20 boilers.

It is instructive to note the economic result of this

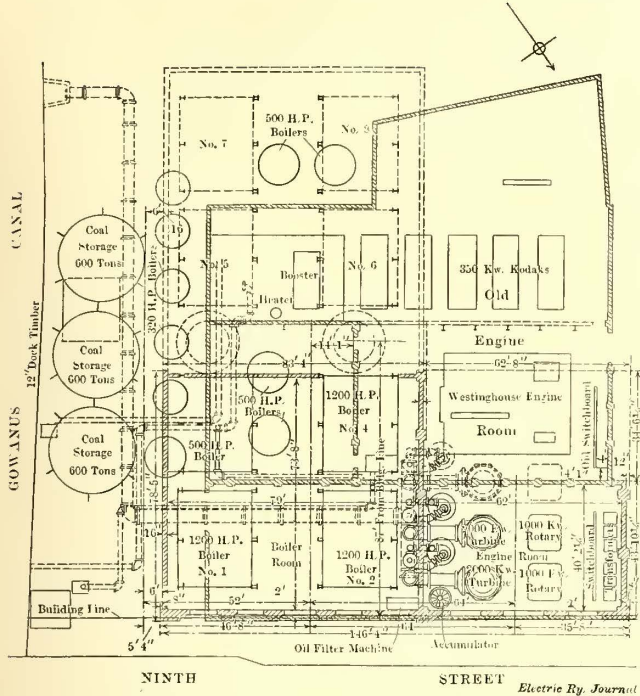
Coney Island load. The remaining site, that of the old steam plant at DeKalb and Central Avenues, was located entirely too far out for economical substation distribution.

the lines and power buildings of the Coney Island & Brooklyn Railroad Company is shown in the accompanying map.

POWER-HOUSE CONSTRUCTION AND FOUNDATIONS

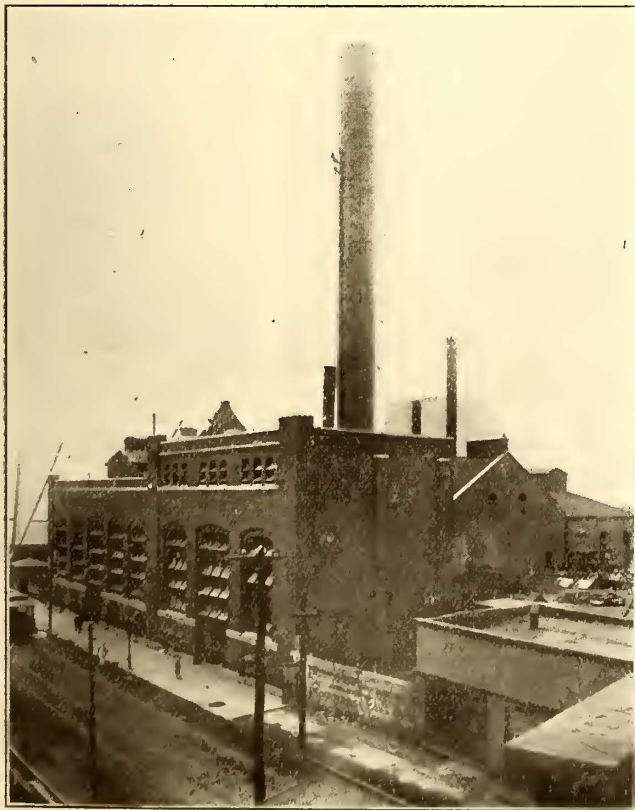
From reading the specifications for the construction of the power station one would gather the impression that the structure, while fireproof and substantial, was that of a plain brick factory building. The appearance of the finished structure, however, is extremely tasteful. The use of red mortar to match the bricks, which of themselves were carefully selected for color, is most harmonious. Even more noticeable are the practically perfect symmetry and proportions. This building brings out forcibly the fact that for power-station purposes, the proper proportioning of the parts of a comparatively plain building gives a more satisfactory appearance than is had in many buildings of more ornamental and costly design. North River bluestone was used exclusively for water tables, belt courses and for all sills and copings. No exposed wood was permitted in any part of the building, which is as fireproof as possible, with the exception that no attempt was made to inclose all the steel work in concrete because the proposed decrease in the insurance rate did not justify the additional expense.

All window and door frames are of No. 22 galvanized iron. The window sash are all equipped with sash-operating devices and the windows are glazed with wire glass. Exterior doors are covered with galvanized iron and the windows above the doors on Ninth Street were constructed removable for the entrance of large machinery. The interior openings are protected by standard tin-covered fire doors, constructed and installed in conformity with

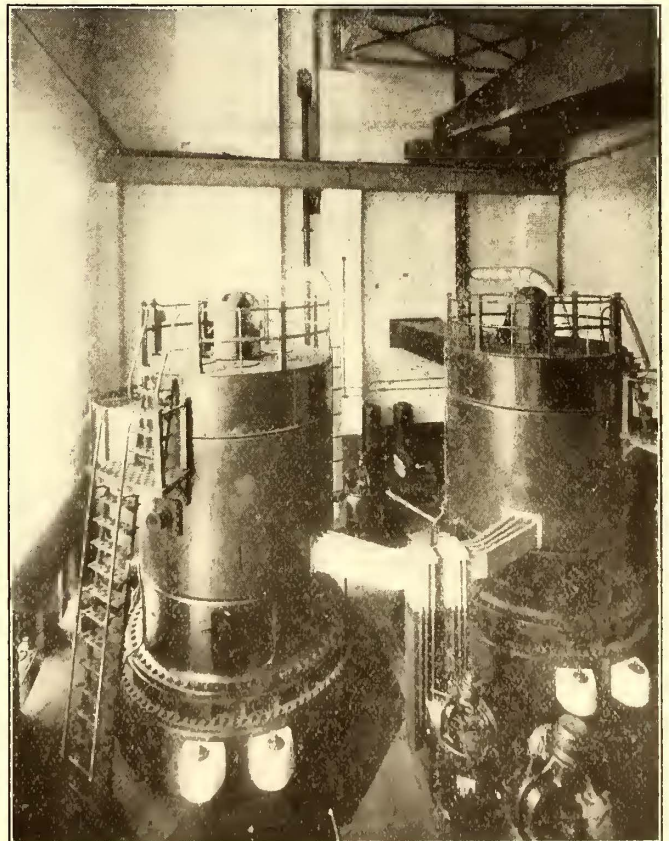


Coney Island & Brooklyn Power Improvements—Plan of Reconstructed Power Station

The proper center of load for the third converter plant was placed on DeKalb Avenue, near Franklin Avenue. It was deemed expedient to purchase the plot for this sta-



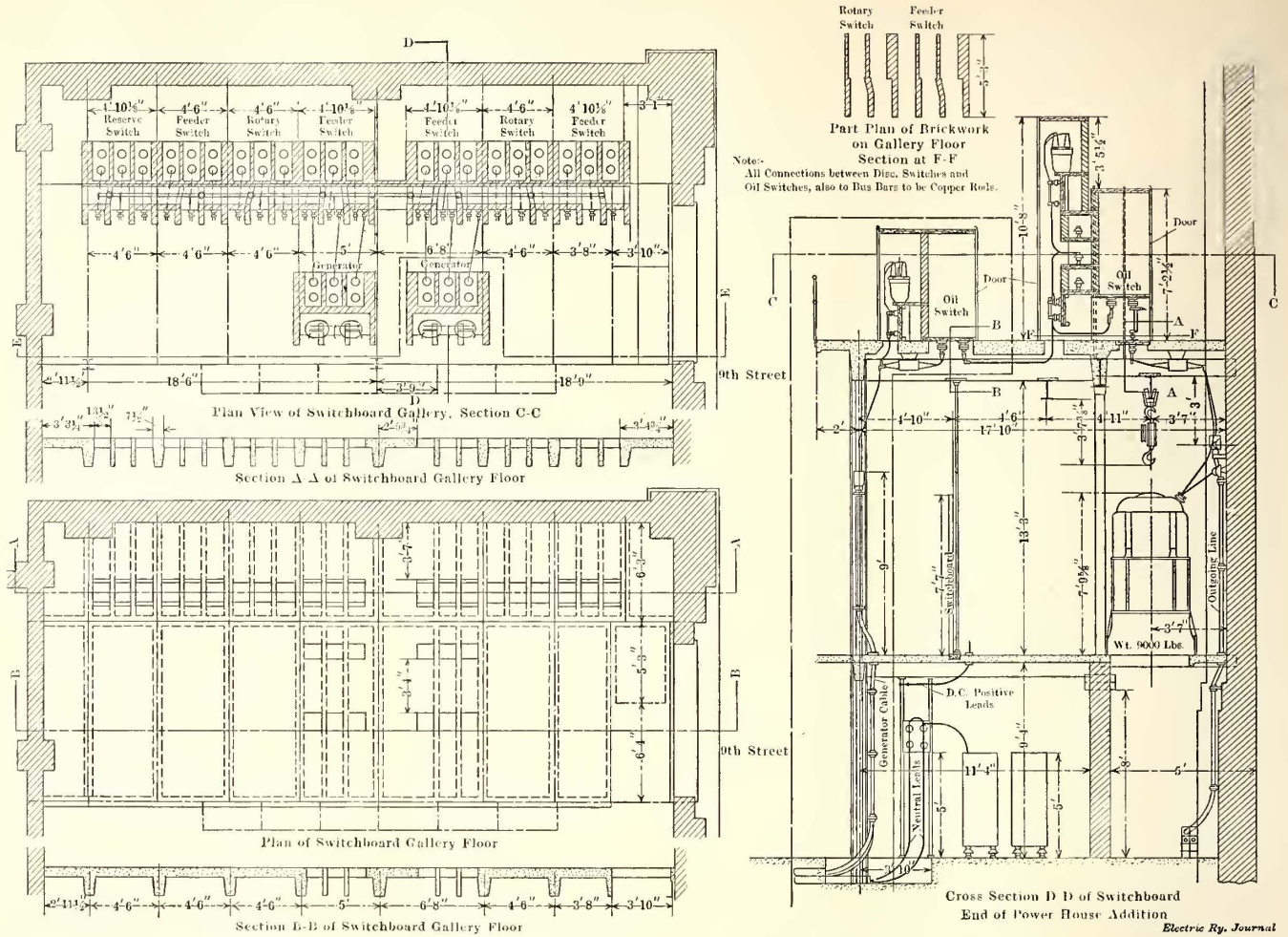
Coney Island & Brooklyn Power Improvements—Reconstructed Power Station



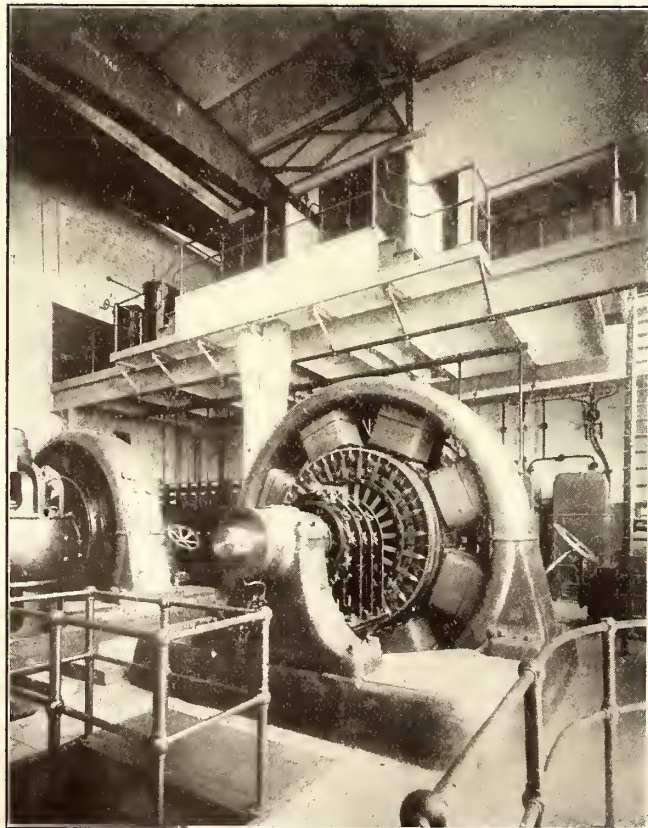
Coney Island & Brooklyn Power Improvements—Turbine Room in Reconstructed Power Station

tion on Sanford Street, at a place slightly off DeKalb Avenue. The latter is an important business street where high prices prevail for real estate. The general layout of

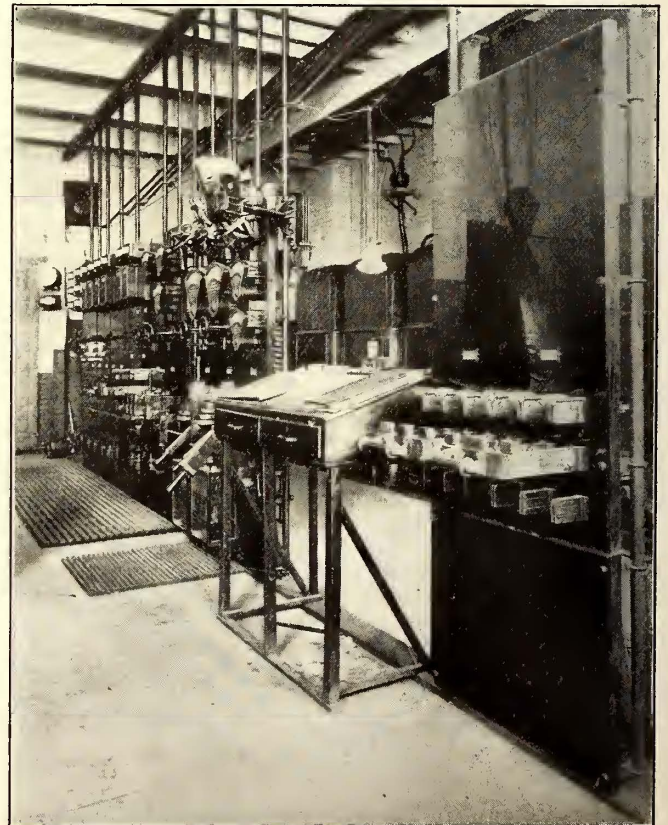
the requirements of the underwriters having jurisdiction. On account of its fireproof qualities cinder concrete was installed where its strength permitted.



Coney Island & Brooklyn Power Improvements—Switchboard in Power Station



Coney Island & Brooklyn Power Improvements—Rotaries in Power Station



Coney Island & Brooklyn Power Improvements—Switchboard in Power Station

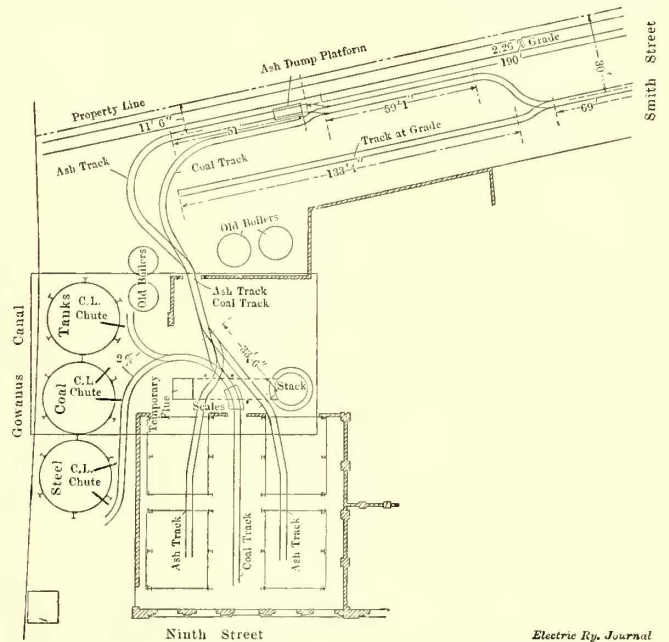
In sounding for foundations it appeared that all the soil in this vicinity is made ground. In addition there was found at a depth of about 20 ft. large quantities of unstable, easily flowing sand. The Raymond system of concrete piling was used and has given very satisfactory results. This choice resulted in a considerable saving in money and time over the use of wooden piles, which would have required extra excavation for capping at the water line. It was further figured that the concrete piles were good for loads of 30 to 40 tons, or about double that allowed for wooden piles. The concrete piles were about 20 in. diameter at the top and were driven 24 ft. to 30 ft. At times some trouble was experienced from the buckling or crimping of the No. 18 steel of the shell, but this occurred infrequently, and the difficulty was obviated by driving a new shell inside the old one. After the first few days no more trouble was experienced from water getting into the shell, as great care was taken to have the concrete ready to dump in quickly as soon as the core was withdrawn and before the water had a chance to enter. It might be added that as the site of the new plant was on that of the old one, it was necessary to remove large quantities of steel rails and concrete which had formed the original foundation.

CONDENSER CONDITIONS

The water in Gowanus Canal is not fit for use in a surface condenser, as it is made foul by the refuse of oil refineries and chemical factories along its banks and there is no movement in it except from the tide. However, the

take pipe which carries water from the canal to the barometric condenser below water level. By so doing any small leakage in the intake pipe would give no trouble. Consideration was given to the plan of placing the centrifugal circulating water pump at the canal. In that case the intake pipe would have been located approximately on the surface of the ground level with the canal bank.

The intake line consists of a cast-iron pipe 48 in. in diameter, delivering the water to the centrifugal circulat-

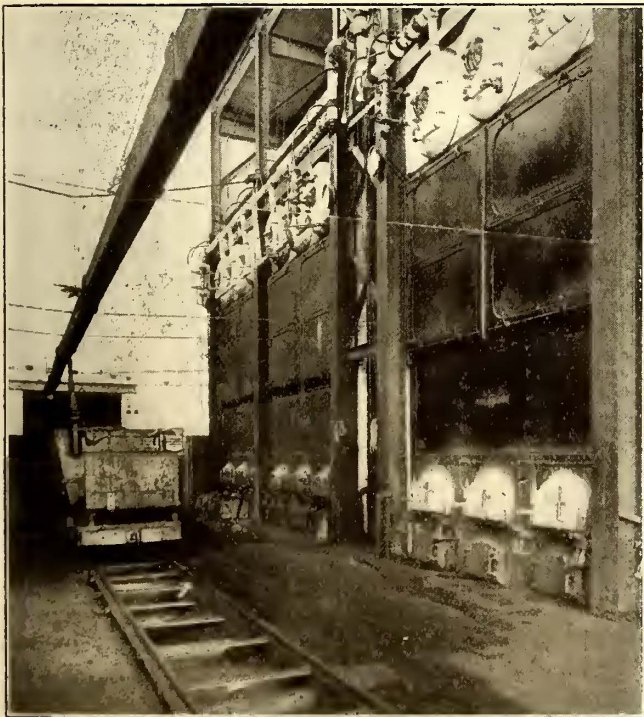


Electric Ry. Journal
Coney Island & Brooklyn Power Improvements—Plan of Coal and Ash Handling Facilities at Power Station

ing water pump located in a pit in the engine room basement, so that the pump is flooded at all times and the liability of leakage trouble and necessity of priming the pump is entirely obviated. Close to the canal there is an intake well, from which the intake pipe leads. This well is fitted with two fine-mesh, heavy wire removable screens. During the latter part of the work much trouble was experienced in the installation of the intake well and pipe, due to the flooding of the ditch when the work was being carried out below low tide. The greater portion of the job was carried on by laborers working at low tide, but the latter part was accomplished entirely by divers. While this work was comparatively expensive, the cost was considered fully justified. The rate of flow in the 48-in. intake pipe is approximately 3 ft. per second for the maximum conditions under which this pipe will be used in the future.

It was intended to install a 36-in. cast-iron pipe for the overflow from the condenser back to the canal. It was found impossible, however, to obtain clearance for such a pipe on account of the presence of the steel tie rods which tie the bulkhead back to the old foundations. Consequently, the overflow was built as a brick flume, wide enough, but not so high, to secure the same capacity as would have been given by a 36-in. pipe. The overflow had been figured for a maximum rate of flow of about 5 ft. per second. By a material widening of the flume this speed was reduced just before the overflow entered the canal, so as to give an easy exit for the water and prevent its washing over the canal boats at low tide. This overflow empties into the canal at a point as far from the intake as possible, so that the hot discharged water will not go back when the tide is running toward the intake.

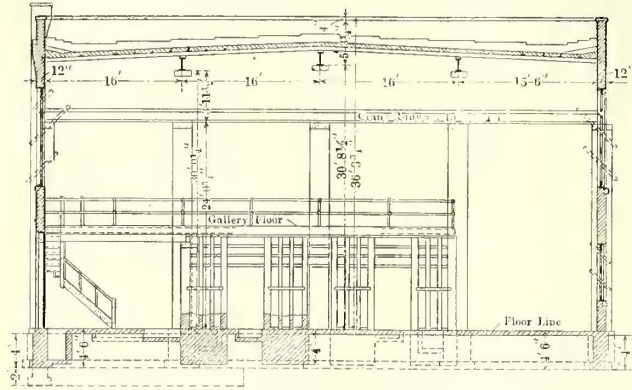
As there is no electrical apparatus located in the base-



Coney Island & Brooklyn Power Improvements—Boiler Room, Showing Coal Cars

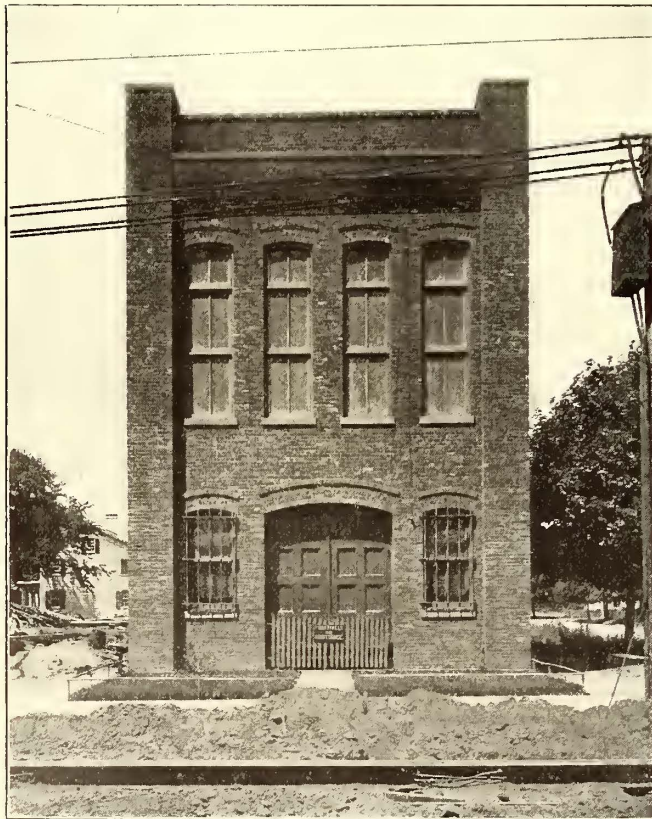
city is now establishing a pumping station at the upper end of the canal, so that the water will be changed twice a day, making it almost as good and cold as that in New York Bay. This new work will obviate any troubles caused by the high temperature of the present stagnant water. The unsatisfactory water conditions led to the adoption of the Alberger barometric condenser. To obviate the usual trouble from leakage of the intake lines when the water in them is under pressure, it was decided to place the in-

ment and no other reason for an electrical attendant in this part of the building, it was decided that it would be preferable to locate the centrifugal pump motors on the turbine room floor. These pumps, therefore, are driven by vertical motors through vertical shafts and rigid couplings. There is a separate pump and motor for each of



Coney Island & Brooklyn Power Improvements—Longitudinal Section of Substation

the two turbines. Each motor is approximately 100 hp, and is of the variable speed type, so that at light loads in the winter it will not be necessary to run at the maximum speed demanded at times of heavy loads in the summer when the water in the canal is very warm. The pit in which the circulating water pumps are located is of waterproofed concrete. There was no objection to a



Coney Island & Brooklyn Power Improvements—Substation 25 ft. Wide on Coney Island Avenue

moderate amount of water in the pit, as there is a sump at one corner, and an arrangement was made for siphoning out water if necessary, but as the top of the pit is at the level of the basement floor and slightly below maximum high water, it was necessary to waterproof it in order to keep out tide water.

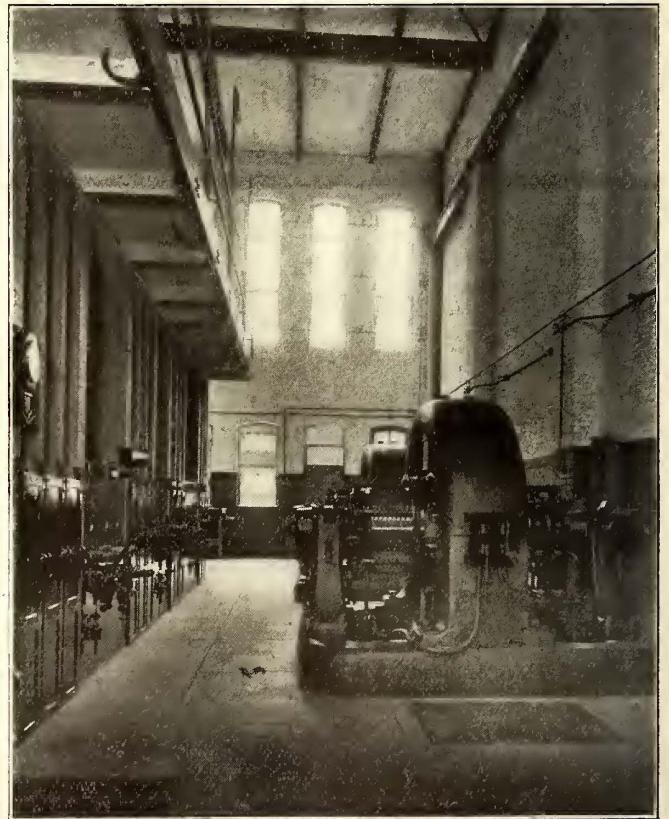
The equipment furnished by the condenser company included the following: Two 44-in. exhaust entrainers; two 44-in. barometric condensers, each complete with air cooler and tail pipe; two 16-in. suction and 14-in. discharge centrifugal circulating water pumps, having a rated capacity of 5800 gal. per minute; two 12-in. x 22-in. x 18-in. horizontal, single-stage, rotative, dry vacuum pumps; four thermometers. The condenser company guaranteed that with injection water at 70 deg. Fahr., each condenser would condense 52,500 lb. of steam per hour and produce 28 in. vacuum; also, that when furnished with injection water at 85 deg. Fahr., each condenser would condense 72,500 lb. of steam per hour and produce 26 in. vacuum.

GENERATING MACHINERY

The new generating equipment consists of two Curtis turbines rated at 3500 kw each on a 24-hour basis. The machines are of the four-stage type, run at 750 r.p.m., and deliver 11,000-volt, three-phase, 25-cycle current. The steam is delivered at 175 lb. with 110 deg. superheat. The guaranteed steam consumption per kw-hour at 28-in. vacuum with different loads is as follows:

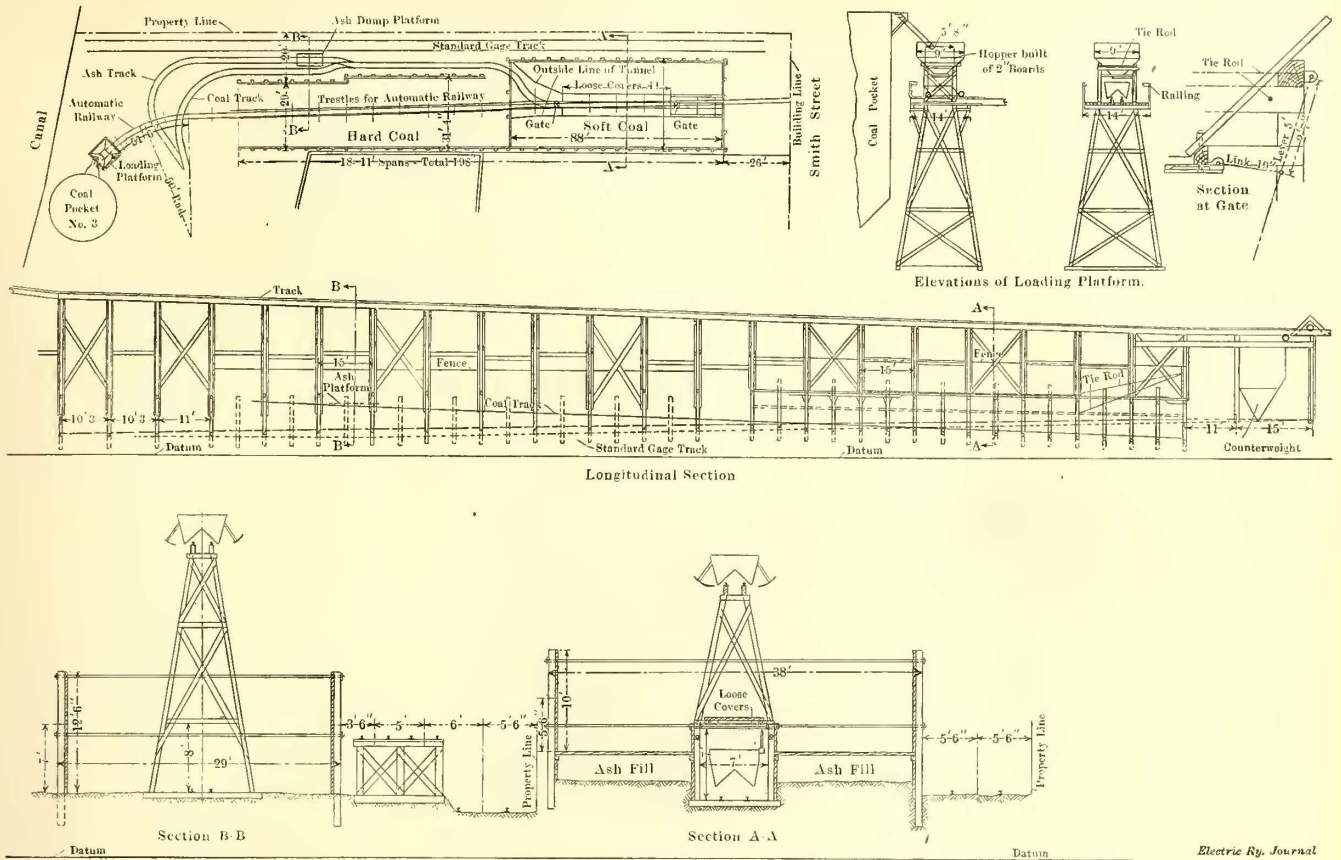
Load	Lb. steam per kw-hour
1000 kw.....	20.0
2000 kw.....	17.8
3000 kw.....	16.4
3500 kw.....	16.4

There was some question as to whether the generators should be wound for 6600 volts, which is the prevailing

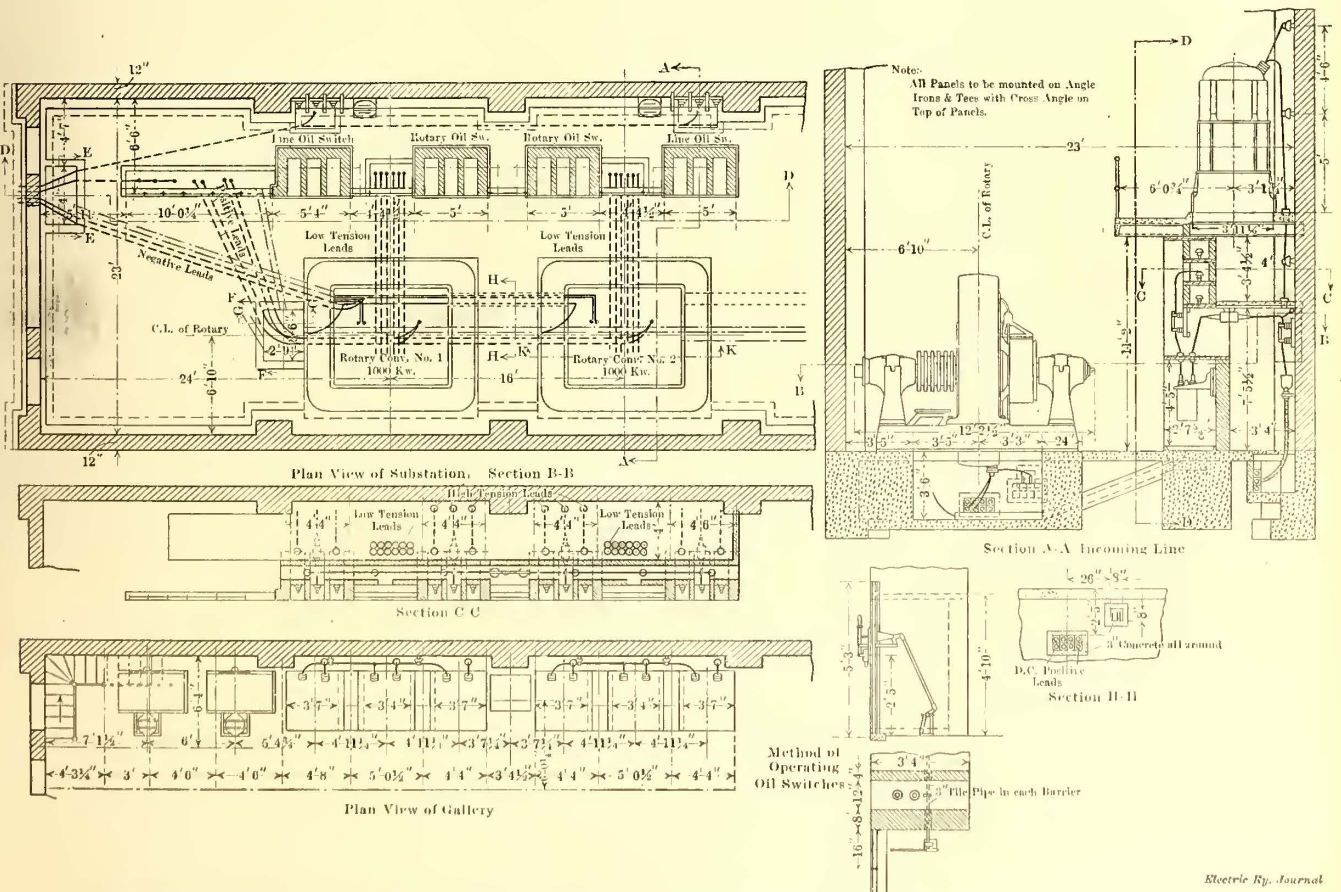


Coney Island & Brooklyn Power Improvements—Interior of Coney Island Avenue Substation

potential used for all the other large power equipments in Brooklyn. The higher potential was finally adopted by the engineers by connecting the generators in star for 11,000 volts (with the neutral grounded) and making the proper provision on the connecting board for changing over to a delta connection to secure 6600 volts.

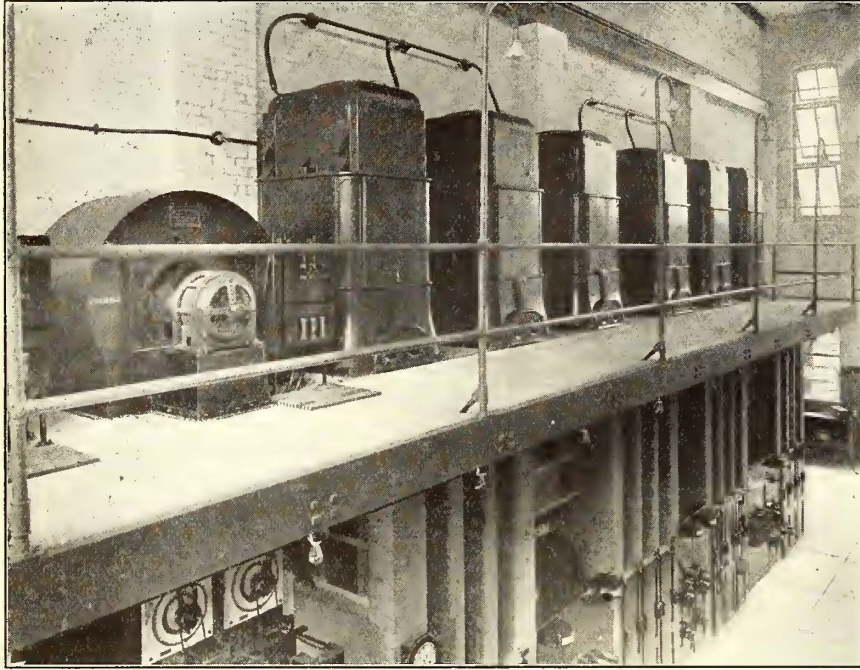


Coney Island & Brooklyn Power Improvements—Details of Coal Storage and Trestle at Power Station



Coney Island & Brooklyn Power Improvements—Plan and Sections of Substation Built on 25-ft. Lot

One 50-gal. accumulator at 650 lb. to 800 lb. pressure is used for the oiling system of both turbines. This capacity is sufficient to supply one machine at rated load for six minutes, or both machines for three minutes. An alarm has been installed in connection with the accumulator to attract the attendant's attention in case of trouble. This alarm sounds early enough to enable the attendant to shut down the turbine before any damage can be done to it. The accumulator was not considered absolutely necessary, but was installed because the added reliability of operation greatly exceeded the small extra cost.



Coney Island & Brooklyn Power Improvements—Transformers on Gallery of Coney Island Avenue Substation

One of the accompanying drawings shows the method of carrying the high potential leads from the connection board on the turbine to the high-tension compartments in the gallery. In this construction the high-tension cables are carried in a duct made of steel framing covered with asbestos board. The leads themselves are cambric-insulated single conductors carried on insulators. Special attention was given to this point, as these leads naturally are not protected by oil switches in all cases, and it was therefore necessary to protect the cables from mechanical injury in every possible way.

The exciting current is furnished by two 75-kw, 2400 r.p.m., 120-volt horizontal turbo-generators of GE type. One of these exciters acts as a spare while the other is used for excitation, lighting and remote electric switch control. No storage battery was installed for the last-mentioned purpose.

HIGH-TENSION EQUIPMENT

The high-tension busbars and switches are placed on a steel and concrete gallery over the main switchboard in the turbine room. The busbar compartments are of hard pressed brick. In most places concrete is used for the shelves and the tops of the busbar and potential transformer compartments, but in some instances Alberene stone was used where special insulating qualities were desired. The 2-in. concrete tops used were made on the ground. They have proved both economical and satisfactory. The electrically operated oil switches are all of the

electrical contractor's H-3 type for the substation and main station apparatus. In the other substations the oil switches are of the hand-operated K type.

Behind the switchboard on the engine room floor there are two banks of three air-cooled GE transformers, each unit of 375 kw capacity. These are also connected in star like the generators, so that 6600 volts can be secured by changing to delta. The wiring is so arranged that the connections can be changed to 6600 volts very readily. In fact, the transformers in any of the substations could be changed over in about an hour. The DeKalb Avenue station was operated for several months with Brooklyn Edison power at 6600 volts before the Smith Street station had been completed. The transformers in the Smith Street station are cooled by two Buffalo forge blowers driven by 430-volt induction motors.

The cables, which were furnished by the National Conduit & Cable Company, are somewhat different from the ordinary 11,000-volt type lead-covered cables. Although the insulation between the conductors is 7/32-in. paper, as is standard, yet the insulation around the three conductors is only 6/32 in. thick. It was thought that on account of the star connection not as much insulation was needed between the conductors and ground as between the conductors themselves. Two No. 000 cables are run to the DeKalb Avenue station and two No. 2 cables to the one at Avenue Q. In each case one of the cables serves as a spare. Vitrified multiple duct conduit is installed between the power house and the two substations for carrying all the a.c. cables, and also the d.c. cables where advisable on account of local conditions.

LOCAL ROTARIES AND SWITCHBOARD

The Smith Street plant contains two 1000-kw, GE rotary converters placed opposite the turbines. This installation is in the main turbine room, to minimize first cost and avoid the need of a separate attendant for the substation apparatus.

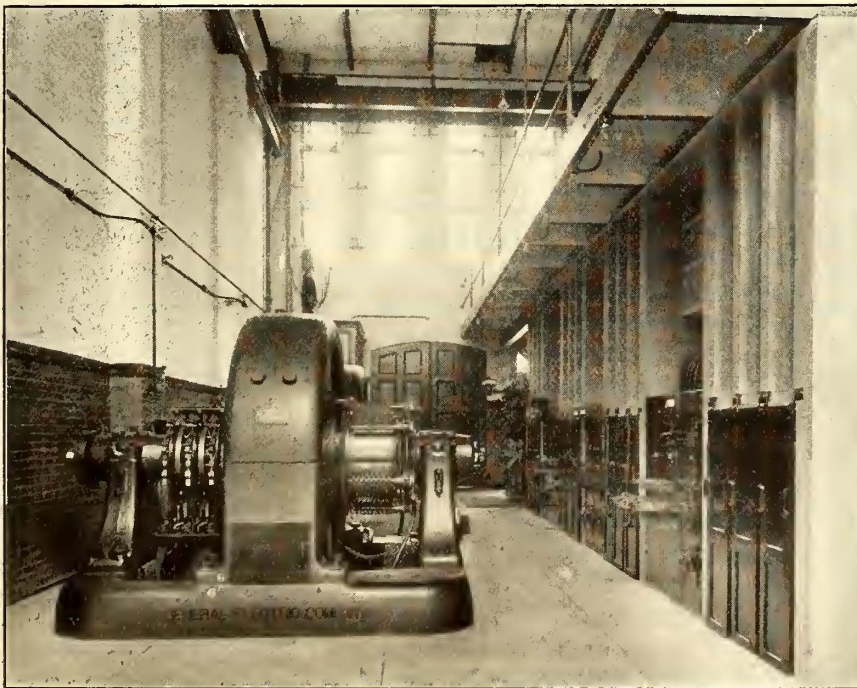
The main switchboard in the turbine room is made of slate panels carrying the control apparatus and instruments for the generating plant. Recording wattmeters are provided on all three substation feeders, and indicating wattmeters are used only on the generator panels. The substations have no a.c. recording wattmeters, but each rotary converter has a d.c. recording wattmeter. The d.c. feeders are controlled from panels in their old location in the engine room.

COAL SUPPLY AND COAL HANDLING

The coal for the Smith Street station is taken from barges by clam-shell buckets which dump into a hopper, feeding a scraper conveyor, which passes over three vertical steel pockets, each of about 700 tons capacity. These pockets are located on the canal bank, and were erected some years ago for the old plant. For the new plant these vertical bunkers were not as economical as could be desired, but since they had been put up at a considerable expenditure, it was decided to utilize them as far as possible. The regular supply of hard coal is kept in these

three pockets, but their capacity would not be enough to take care of the company's needs in case of a protracted coal strike or ice blockade in the canal. Consequently, it was deemed necessary to provide in the yard adjoining the power house facilities for storing on the ground an extra supply of 2000 tons, enclosed at the side with wooden planking. The cost of the extra storage was estimated at \$12,000, as against \$20,000 previously figured for a fourth steel bunker of about one-third the proposed capacity. This open storage is used for all soft coal and the emergency hard coal. Fuel for the open storage is delivered by an extension of the old conveyor into a new hopper, which is arranged to drop its contents into a car running over an automatic railway. The soft coal is dumped over a tunnel, so that when the gates are opened the cars beneath will load without shoveling until the bin is three-quarters empty. One man handles all the coal and ashes. The former amounts to about 70 tons a day.

A 2-ton capacity, 30-in. gage trolley electric locomotive is used to haul coal from either the vertical bunkers or the yard storage, and also for hauling 1-ton ash cars from the boiler room to a track where their contents can be dumped into standard gage cars. The coal-car tracks from the storage bin to the boiler room have an up-grade of approximately 5 per cent, and the ash-car track also has a 5 per cent up-grade from the basement to the platform where the ashes are dumped into the large ash cars, to be delivered at Coney Island and elsewhere, where they are



Coney Island & Brooklyn Power Improvements—Switchboard Panels in Coney Island Avenue Substation

sold for sidewalks and filling. The general plan of both tracks is shown on an accompanying plan. The steel building columns in the boiler room are strong enough so that coal bunkers can be placed over the boilers at some future time simply by raising the present roof.

Arrangements were made to use low-grade No. 3 buckwheat anthracite and mix it with 10 per cent to 15 per cent bituminous at times of heavy load. The use of a low-grade anthracite made it advisable to provide for Sturtevant forced draft up to a pressure of $2\frac{1}{2}$ in. of water, but normally a pressure of 1 in. is used.

BOILER EQUIPMENT

The boiler room is arranged for eight boilers, but at present the equipment consists of three pairs of B. & W. water-tube boilers aggregating 3600 hp. The boilers are carried from straps and the settings on steelwork. All boilers are furnished with Webster furnaces and Neems Brothers grates, $12\frac{1}{2}$ ft. wide by 12 ft. long, designed for low-grade anthracite. The heating surface of each boiler consists of three steam and water drums 42 in. in diameter, 23 ft. 5 in. long, placed above and connected to a set of 21 sections of tubes. Each set consists of 14 tubes 4 in. in diameter and 18 ft. long. Hand firing is now used, but the arrangements permit the ultimate use of mechanical stokers. The boilers are designed for 200 lb. pressure per square inch, but at present they are operated at 180 lb. pressure, with 110 deg. superheat. The superheaters, which are also of B. & W. type, are placed between the first and second passes of the gases.

The chimney is a steel, self-supported stack, 200 ft. high, of 12 ft. inside diameter and lined with red brick to a height of 40 ft. The choice of steel over brick was influenced by the fact that there was no room for the extra large base needed with brick. This stack is designed to care for 4800 hp in boilers, it being the intention to erect a second stack of similar size when the boiler room is extended for a greater capacity than that mentioned. To avoid cinder trouble as much as possible, the breeching just before entering the stack entrance was very much enlarged in cross-section to reduce the flow of gases to approximately 11 ft. per second under the maximum conditions under which the stack would be used. A settling pit filled with water was provided for the deposit of cinders, it being intended to drop the cinders before they entered the stack, due to the lower velocity of the gases at that point.

STEAM AUXILIARIES AND LUBRICATION

In addition to the exciters and forced-draft fans, the steam auxiliaries include the vacuum pumps, oil and pressure pumps, two duplex feed pumps, which were installed in the old power house, and a new Cochran open-type feed-water heater and purifier. The feed-water heater is rated at 4000 hp, and when supplied with 20,000 lb. exhaust steam per hour at atmospheric pressure will raise the temperature of 125,000 lb. of water from 50 deg. Fahr. to 210 deg. Fahr., or it will raise 210,000 lb. of water per hour from 50 deg. Fahr. to 115 deg. Fahr. It was not considered advisable to pay for an equipment which would

raise the temperature of the maximum amount of water used to 210 deg. Fahr. The oil separator of this equipment does not allow more than one-half a grain of oil per gallon.

All oils are stored in a fireproof room separated from adjoining sections by brick walls and a fireproof door. The capacity of the combined filter and storage tanks is 650 gal., which is sufficient to insure a continuous supply of cool, clean oil for three turbines of the size installed.

PROVISION FOR STATION GROWTH

As the Smith Street installation is now laid out, any desired extensions can be made by adding equipment in

the older portions of the layout south of the new apparatus. The boiler room can be thus extended for an ultimate capacity of 9600 hp. There would likewise be plenty of room for new turbines and switchboard extensions. Many of the details have already been arranged for the reception of a third turbine, as there is sufficient room between the second turbine and the reserve Westinghouse generating set to install a new machine simply by removing a portion of the present dividing wall. If the building is extended only in a southern direction, the limitation of growth, of course, will be the capacity of the boiler room. After this limitation has been reached, it would still be possible to double-deck the boiler room or construct an additional boiler room on the opposite side of the turbine room on ground now used as a car house. It will thus be seen that, although the present power house is comparatively small for New York City, the design and location are such that as much capacity could be ultimately secured as would probably ever be needed by the Coney Island & Brooklyn Railroad Company.

SUBSTATIONS

The larger of the two outside substations is on Sanford Street near DeKalb Avenue. Like the substation in the power house, it contains two 1000-kw rotaries and six 675-kw transformers. The switches are of the K type and are hand operated. All of this equipment is housed in a building of selected red brick and colored mortar, after the general style of the power house. The architectural features also follow the same design.

The arrangement of the apparatus at Sanford Street deserves special attention. As shown on the accompanying plan, the building itself is only 25 ft. wide, and yet there is plenty of room from an operating standpoint. The switchboard and high-tension apparatus being on the same floor as the rotaries, but one attendant is needed for the operation of the substation. If the station had been wider than 25 ft., two lots would have been required. The substructure has space for three 1500-kw rotaries and is capable of extension throughout the lot, which is 100 ft. deep, thus allowing more than enough room for future requirements.

The third substation is at Coney Island and Avenue Q, close to the location of the old steam plant. This building is of similar construction as the Sanford Street station, and contains two 500-kw rotaries, six 185-kw transformers and K-type switches. The electrical equipment in the substations, like that of the power plant, is of the General Electric Company's manufacture throughout.

There is no spare equipment at either outside substation, but one of the 1000-kw rotaries at Smith Street may be considered as a spare when the reserve d.c. generators are taken into consideration. In case of trouble with a rotary converter at either outside substation, part of the d.c. load can be shifted to Smith Street.

ENGINEERING AND MANAGEMENT

The entire reconstruction of the power houses, substations and feeder system was carried out by Ford, Bacon & Davis, W. H. Sawyer being directly in charge of this work for them. S. W. Huff is president and general manager of the Coney Island & Brooklyn Railroad Company, and the operation of the power system is in charge of P. J. Murphy, superintendent of power.

Bucharest, the capital of Roumania, has authorized a loan of \$2,000,000, of which \$600,000 will be used in the construction of a municipally owned tramway system.

WHAT CONSTITUTES A LEGAL TENDER FOR A FARE

BY HOWARD C. LAKE, OF THE NEW YORK CITY BAR

While a passenger on a street railway is ordinarily not expected always to have the precise amount of fare to tender, the carrier's employees are not required by law to furnish change for anything more than a reasonable amount. By the passenger's boarding the car the relation of debtor and creditor is established with all its rights and liabilities, consequently a person may be ejected from the car, no more force than is necessary being used, for his failure to comply with a reasonable rule of the company. Hence the question has often been raised: What is a reasonable request of a street railway conductor with respect to the changing of bills of comparatively large denomination in payment of fares?

Three times within the last quarter of a century the highest courts of as many leading, although widely separated, States have adjudicated the question. In California and Tennessee it has been held that a \$5 bill or coin is a reasonable amount to tender in payment of a 5-cent fare and that the company's representative is required to change it. But New York's highest tribunal, the Court of Appeals, holds that a company rule requiring change to the amount of \$2 to be furnished by conductors on street cars is a reasonable provision for the convenience of the public and the conductor cannot be required to furnish change for a \$5 bill. The question of what is a reasonable amount to require changed has uniformly been held one of law for the court or judge to decide rather than one of fact for the jury.

The California decision, rendered in 1889, seems to have been prompted, at least in part, by prevailing conditions which were purely local, for the judge who wrote the opinion said therein: "It is a well-known fact that the \$5 gold piece is practically the lowest gold coin in use in this section of the country." The facts in the California case, briefly stated, were that the passenger had no coin of any smaller denomination than a \$5 gold piece, which he offered to the conductor in response to his demand for fare. This the conductor refused because he could not change the coin. Thereafter the crew of the car forcibly ejected the passenger, injuring him. The passenger's recovery of \$500 damages against the company, which counsel for both parties had stipulated at the trial was a fair estimate of the passenger's damages, if he were entitled to any, was sustained on appeal. After disposing of the proposition that a passenger on a street car where a uniform sum is charged for any distance, does not have to tender his exact fare, the court says that it does not follow that he may tender any sum, however large, saying: "The true rule must be, not that the passenger must tender the exact fare, but that he must tender a reasonable sum, and that the carrier must accept such tender and must furnish change to a reasonable amount."

The company argued that the establishment of a rule requiring change for \$5 would lead to great inconvenience, requiring the company to furnish its conductors "with sufficient small coin to do a general exchange business with all passengers, thus requiring the company to intrust to a class of employees who are usually of no pecuniary responsibility large sums of money." The court's answer was that with the question of convenience it had nothing to do "except insofar as it bears upon the question whether the amount tendered was a reasonable sum, such as the carrier was bound to accept. * * * The fears of the appellant [company] are based upon the assumption that passengers

generally will contumaciously, to avoid the payment of fare and require the companies to carry them free, offer coin of a large denomination. But these fears, we think, can safely be set aside upon the theory that a question like this will, as is usual, settle itself through a spirit of mutual accommodation between carrier and passenger."

The decision in New York came about a decade ago, where the reasonableness of the rule requiring change for a \$2 bill, but no larger, was argued with unusual ability and distinction. The passenger, Barker, was apologetic as he tendered a \$5 bill, saying, "I have only got a \$5 bill," and the court remarked that he himself regarded his offer as unusual and requiring explanation. The court said it agreed with the California court that a passenger is not bound to tender the exact fare, but must tender a reasonable sum, but could not assent to the conclusion that a tender of \$5 is a reasonable sum. The court said:

In the case at bar the reasonableness of the rule established by the defendant is obvious. In a large city like New York the round trip of a car on any street line means a very considerable number of fares paid in and the necessity for the conductor to carry and pay out a large amount of small change. When the defendant enacted the rule requiring its conductors to furnish change to a passenger to the amount of \$2 it did all that could reasonably be expected of it in consulting the convenience of the general public and it would be unreasonable and burdensome to extend the amount to \$5. It would require conductors to carry a large amount of bills and small change on their persons and greatly impede the rapid collection of fares.

When the question arose in Tennessee not long ago the court sided with its far Western sister in holding that a rule fixing a \$5 bill or coin as the maximum amount required to be changed was reasonable. The paragraph from the New York case which we have given above was quoted.

The passenger in most, if not in all, the above cases contended that the rule was unknown to him and that he could not be said to be bound thereby. This contention has each time been briefly and firmly overruled. Said one judge:

It is so reasonable in its terms and so necessary to the convenience of the company in the collection of fares that the public was charged with notice of it. When the fare to be paid, as in this case is so small, and the number of passengers so numerous, any one proposing to take passage upon one of the cars of the company is bound to know the necessity of providing himself with change reasonably near the amount of fare to be paid and of the inconvenience and probable impossibility of the conductor-furnishing change in large amounts.

In view of the decisions quoted it is interesting to inquire what the respective rights and duties of the passenger and conductor are when the amount tendered is above the legal fare, which in New York State has been held to be \$2 and in Tennessee and California \$5. It is safe to say that the passenger always has the right of giving the large bill to the conductor and obtaining from him a receipt for it so that he can present his claim to the main office at some later date and collect the change. It would be well for the conductor in any case to suggest this course. If the passenger declines to do so and is unable or unwilling to give any smaller change and the conductor cannot change the large bill the passenger can legally be ejected, although some companies provide in their rule books that in cases of this kind the passenger should be allowed to continue his ride. If ejection is decided upon care should be taken that it is carried out in a perfectly legal manner so far as the force used and the time and place chosen. These matters are fully covered by legal decisions.

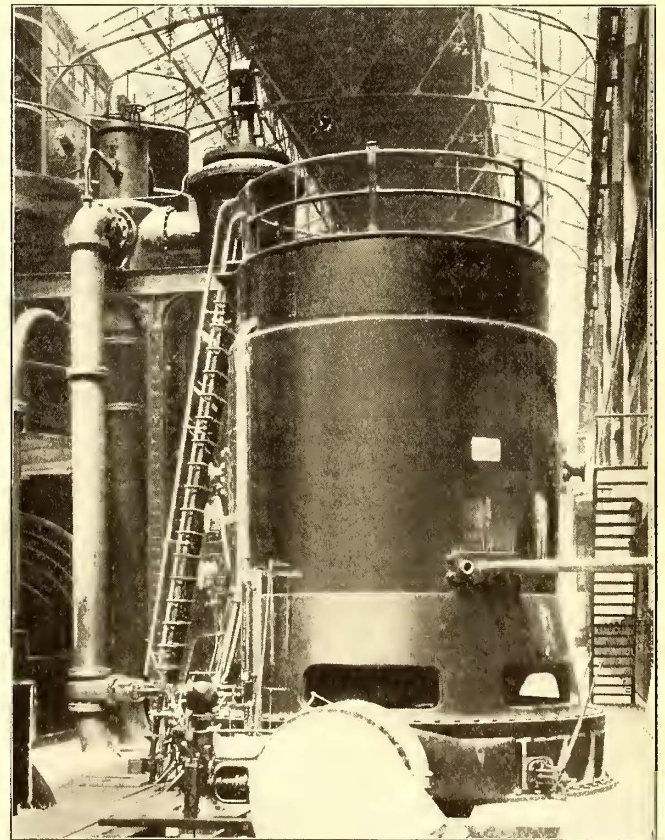
The question of the character of the bill tendered by the passenger has some bearing on the subject at issue because

while all forms of United States currency are received as par at the banks, banknotes themselves are not a legal tender. A newspaper paragraph some time ago stated that a company had successfully defended a suit for ejection in a lower court in a State where the legal tender for a fare is \$5 because the passenger tendered a \$5 banknote instead of a greenback or silver certificate. It is questionable whether this difference would be recognized by the highest tribunal in a State if the case of the passenger otherwise was good, but the question of character of bill is at least an interesting one.

5000-KW. EXHAUST-STEAM TURBINE IN INTERBOROUGH POWER HOUSE

The Interborough Rapid Transit Company, of New York City, has just placed in operation in its subway division power house at Fifty-ninth Street and Eleventh Avenue, a 5000-kw Curtis exhaust-steam turbine, on the performance of which hinges the immediate installation of two others of the same size and the ultimate doubling of the station output by this means.

The Interborough power house contains at the present time nine Allis-Chalmers combined double horizontal and



5000-kw, Low-Pressure Steam Turbine in Power House of Interborough Rapid Transit Company

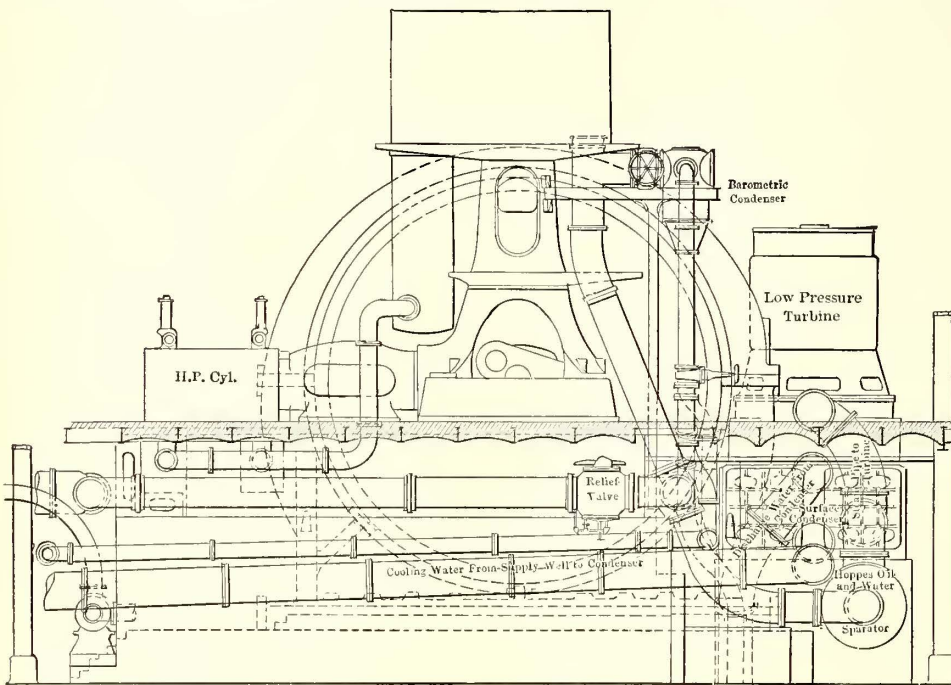
vertical engines, having a nominal rating of 7500 ihp each, and three Westinghouse-Parsons turbines rated at 1250 kw each. The low-pressure turbine is located between the first and second engines, and the relative size of both units is well shown in the side elevation. The high-pressure cylinders of the engine are horizontal and the low-pressure cylinders vertical. The dimensions of the cylinders are 42 in. and 86 in. in diameter by 60 in. stroke, and the speed is 75 r.p.m. Both pistons of each side of the engine are connected to one crankpin. Steam enters each high-pres-

sure cylinder at from 175 lb to 200 lb. pressure through a 14-in. pipe, and from there passes into a receiver through a 16-in. pipe, whence it passes to the low-pressure cylinder. This receiver is not steam jacketed. The engines have poppet valves on all the high-pressure cylinders to provide for the use of superheated steam; but the usual Corliss valve gear is employed on the low-pressure cylinders. The generators are of the Westinghouse revolving-field, fly-wheel type, the field structure being mounted directly on the engine shaft. The generators are rated at 5000 kw, 25 cycles, three-phase, 11,000 volts.

Ordinarily, the exhaust piping from the engine starts from the condensers with a 30-in. relief valve. From this

a surface condenser instead. The turbine resting directly over the condenser not only makes a better vacuum possible, but by equipping the exhaust pipe between the low-pressure cylinder of the engine and the turbine with an oil separator, the condensation is made available for boiler feed purposes. At present all the boiler feed-water is purchased from the city at a large annual expense, and if the condensation from the turbine can be utilized again a saving will result.

The low-pressure turbine is directly coupled with an induction generator rated at 5000 kw, three-phase, 25 cycles, 11,000 volts, and the leads are connected to the reciprocating engine generator without switching apparatus. The turbine, which is a three-stage machine, has no governor, and is controlled in speed by the engine generator, which latter is controlled by the engine governor. On a vacuum of 28 in. and with the low-pressure cylinders exhausting at a back pressure from 12 lb. to 17 lb. absolute, the steam consumption is less than 15 lb. per kw-hour. The combination is still under test, and the results are not at present available for publication. However, it may be stated that the output of the station can be doubled by the installation of exhaust steam turbo-generator sets at a cost of about one-third of that of the original installation.



Side Elevation of Engine and Turbine, Interborough Power Station

valve the pipe, which is 30-in. in diameter, drops through the main operating floor to the basement, where the exhausts from the two units unite into one 40-in. riser, which is carried to the roof. The exhaust piping is of riveted steel and is equipped with both corrugated copper and slip expansion joints. The condensing system for each engine generator unit consists of two Alberger jet condensers with barometric column discharge, two hot wells of concrete and expanded metal, one dry vacuum pump and one cross-compound circulating pump. Each condenser is supported on specially designed steel work placed in front of the engine, and is connected directly to the exhaust outlet of the low-pressure cylinder by means of a single elbow on one side and the relief valve of the atmospheric exhaust line on the other. The condenser head or chamber is 50 in. in diameter and terminates at the bottom in a cone-shaped connection to the tail pipe, while the top is provided with a chamber in which the entrained air and vapor collect and to which is connected the air pipe to the dry vacuum pump. On the side, 90 deg. from the steam pipe and the exhaust relief valve, the circulating water enters, while directly opposite in the vapor chamber is the air-pump connection. The water for use in the condensers is taken from the North River through a concrete tunnel.

The use of the low-pressure turbine has necessitated some changes in the exhaust lines and condensers. The jet condensers are not used on the engine to which the exhaust turbine is connected, the turbine being equipped with

Avenue and the North River, and the structure and site represent the largest item in the investment. Doubling the output does not entail the expenditure of any money for real estate, it being possible to install the added equipment in the present structure. If reciprocating engines were employed, another structure of the same size would be required. H. G. Stott, superintendent of motive power, has given serious thought to this work for some time, and it is to him that the credit is due of installing the largest low-pressure turbine at present in use.

ENTERTAINMENT AT DENVER

The entertainment committee of the Manufacturers' Association is desirous of continuing at the Denver convention the annual supply men's vaudeville performance which has met with such favor in years past. Some of the former participants will not be able to attend the convention this year, and others have reached the age limit; therefore the committee is obliged to engage some new talent. Judging from what has already been produced, it should be possible to arrange an entire bill composed only of railway supply men. The committee would like to be advised of the names and addresses of amateur specialists who expect to attend the convention, and guarantees to any volunteers immunity from expressions of disfavor. Communications should be addressed to A. L. Whipple, chairman of the entertainment committee, 50 Church Street, New York.

MEETING OF THE COMMITTEE ON INTERURBAN RULES

A meeting of the committee on interurban rules of the American Street & Interurban Railway Transportation & Traffic Association was held at Fort Wayne, July 27, to summarize the work accomplished by the committee during the year, and also to put in final form the conclusions reached by the committee at the meeting at Washington, May 25. It will be remembered that at the Washington meeting, which was reported in the *ELECTRIC RAILWAY JOURNAL* for May 29, one of the most important changes in the rules was the tentative adoption, as nearly as possible, of the American Railway Association rules for the movement of cars by train orders. Another was in regard to the conditions under which trains may proceed, preceded by a flag. At the meeting at Fort Wayne these changes were formulated, and it is the intention of the committee to recommend them at the Denver convention.

Through the courtesy of J. N. Shannahan, chairman of the committee, the following summary of the changes tentatively adopted at the Fort Wayne meeting of the committee is published.

The rules which are changed are printed in consecutive order. The additions to old rules and the new rules are set in italic. Words or phrases in the old rules which are omitted in the new rules are enclosed by brackets. In a few cases, as in the rules of audible signals and the method of obtaining train orders, certain portions of the old rules have been retained, but to avoid confusion of the reader, the entire new rule is set in italic. The rules which are not printed below have not been changed in wording, except that rule 430, which was the same as rule No. 24, has been omitted entirely.

GENERAL RULES

Packages.

26. Employees must not carry packages, letters or newspapers [for any one not having business with the Company] without an order from the proper authority.

Switch Keys.

31. *The will be the custodian of switch keys, and will be held strictly responsible for their distribution, delivering them to such persons as are required to use them in the performance of their duties, and taking receipt therefor on forms provided for that purpose. Employees to whom switch keys have been delivered will be held responsible for their use and must report at once any loss of same. All employees must report at once in writing to their superior officer any misuse of a switch key, or any person having a switch key in his possession who is not so entitled, and it shall be the duty of such superior officer to see that any such switch key or keys are recovered and returned to the A deposit will be required to guarantee the return of switch keys, badges and rule book and other property of the company upon leaving the service.*

Laws of.....

32. [31] All laws of the State of covering common carriers, and applicable to interurban operation, must be observed. *Extracts from important laws will be found in the back of this book.*

DEFINITIONS

Train.

50. An engine or motor, or more than one engine or motor, coupled with or without cars, displaying markers.

Current of Traffic.

62. *The movement of trains on a main track, in one direction, specified by the rules.*

STANDARD TIME

Standard Clocks.

82. *The clock in the dispatcher's office at, and such others as may be hereafter designated, are standard clocks.*

Station Clocks.

82. (a) When station clocks are provided, station agents must see that they show correct time; but trainmen must not take time from such clocks unless they are designated as standard clocks.

AUDIBLE SIGNALS

Communicating Signals.

103. CONDUCTOR TO MOTORMAN

SOUND INDICATION

- (a) *One* When train is running, stop at next station.
 (b) *Two* When train is standing, start forward.
 (c) *Three* When train is running, stop at once, emergency.
 (d) *Four* When train is standing, back the train.
 (e) *Four* When train is running, reduce speed to four (4) miles per hour until two (2) taps of the bell or two whistle cord signals are given, when the train will proceed at scheduled speed.
 (f) *Five* When train is standing, call in flagman.

104. MOTORMAN TO CONDUCTOR

- (a) *One* Come forward.
 (b) *Two* Pull trolley down to roof.
 (c) *Three* Set rear brakes.
 (d) *Four* By motorman is signal to conductor that he wishes to back train, and must be answered by conductor before train is backed.
 (e) *Five* Watch trolley.

TRAIN SIGNALS

Rear End Signals.

110. *The following signals will be displayed, one on each side of the rear of every train, as markers, to indicate the rear of the train: By day, green flags; by night, green lights to the front and side and red lights to the rear; except when the train is clear of the main track, when green lights must be displayed to the front, side and rear.*

USE OF SIGNALS

Signals at Switches.

130. After a regular scheduled train clears the main track, and switches are properly set for main track, the conductor must step to the side of the track opposite the switch stand until after the opposing train has passed, keeping his hand lantern at night in full view of the approaching train, but giving no proceed signal.

CLASSIFICATION OF TRAINS

Extra Trains.

202. Extra trains are [of] inferior [class] to all scheduled trains of whatever class, and have no rights except those conferred upon them by train order.

MOVEMENT OF TRAINS

Trains Leaving Initial Stations.

203. A train must not leave its initial station on any division or a junction, or pass from double to single track, *without order or clearance, and until it is [has] ascertained, by asking the dispatcher, whether all trains due have arrived or departed, mentioning particularly the last train due, giving the train number.*

Where a train register is maintained, it shall be the duty of the conductor to register and to note carefully whether all trains due have arrived.

If in such case the motorman or conductor cannot reach the dispatcher, the train will proceed on time table rights "protected by flag," then call from all succeeding telephone stations until he has succeeded in reaching the dispatcher.

Explanation of "Protected by flag" as used in rule 203.

203. (a) *Trains will be operated under control within one-half of the range of vision on straight track. At all curves, dangerous and obscure places, conductor will go ahead of his train, using red flag by day and red and white lantern by night (white lantern to signal his train ahead and red lantern to stop any opposing train) a sufficient distance to fully protect his train.*

Trains of Inferior Class.

205. A train of inferior class must in all cases keep out of the way of trains of a superior class, and must clear the time of such [scheduled] trains five minutes unless a meeting or passing order has been given.

Scheduled Trains Have Equal Rights to Meeting Points.

206. All scheduled trains of the same class, or sections of scheduled trains, have equal rights to scheduled meeting points between reporting stations.

Distance Required Between Following Trains.

210. *Unless some form of block signal be used, clearing at least five minutes apart, trains running in the same direction must keep not less than three thousand (3000) ft. apart, except in closing up at stations or meeting points. When the view is obscured by curves, fog, storms, or other cause, they must be kept under such control that they may be stopped within the range of vision.*

Arrangements for Sections when Telephone Defective.

213. When telephone line is out of order, any scheduled train when requested by conductor of any train, may carry

signals for such, as a section following, without first obtaining orders from the The conductor of train desiring signals displayed shall issue second section order in duplicate as per Number 3, Form F, Rule 280, to be duly signed by the respective conductors. Both copies of order to be turned in by the conductors of the respective trains. Scheduled train, under such arrangement, will immediately display signals, though extra train must not follow the regular train until it is certain that signals are so displayed.

Delayed Trains.

230. All regular trains, or sections of a regular train, when becoming minutes late, must report to the dispatcher, and will also report for each successive minutes lost. If unable to get the dispatcher by company or long distance telephone, the train may proceed on its time card rights until it is minutes late, after which it must not proceed except by flagging, according to Rule 203a.

All regular trains, or sections of a regular train, after they have become minutes late, [such trains] will lose their time card rights.

Rights of Delayed Trains.

[231. A train which is delayed and falls back on the time of another train of the same class does not thereby lose its rights.]

RULES FOR MOVEMENT BY TRAIN ORDERS

Train Orders.

250. For movement of trains not provided for by time table, train orders will be issued by authority and over the signature of the Superintendent or other designated authority. Train orders must contain neither information nor instructions not essential to such movements.

Train orders must be brief and clear, and in the prescribed form, when applicable, without erasure, alteration, or interlineation.

Train orders shall be numbered consecutively, commencing with No. 1 at midnight.

How Addressed.

252. Train orders must be addressed to those who are to execute them, designating the place at which each is to receive his copy. They must be addressed to the conductor and motorman, and also to any one who acts as pilot. A copy for each person addressed must be supplied by the person taking the order.

Orders addressed to agents or operators restricting the movement of trains must be respected by conductors and motormen, the same as if addressed to them.

Designation of Trains.

254. Scheduled trains will be designated in train orders by their numbers, as "No. 10" or "2d No. 10," adding motor [car] numbers; extra trains by motor [car] numbers, as "Extra 798," with the direction as "East" or "West."

How to Obtain Orders.

256. To obtain orders at telephone stations, the motorman will call the dispatcher, and report train number and location. The dispatcher will then indicate whether a 31 or 19 order is to be taken.

Procedure if 31 order is given:

The dispatcher will give such orders as are necessary to the motorman, who will write the same plainly, and without unauthorized abbreviation, on the blank provided for that purpose, with sufficient carbon copies for each member of the crew, and when he has finished writing the order he will read it to the dispatcher, who will O.K. the same, if correct. The motorman will thereupon sign his name upon the order. The conductor will then read the order to the dispatcher, and if correct, the dispatcher will complete the order, by giving the initials of the superintendent, or other designated authority, and the time of completion, which initials and time of completion, together with the signature of the conductor, shall be promptly written upon the order by the conductor, after which the order shall be in full force and effect.

Procedure if 19 order is given:

The dispatcher will give such orders as are necessary to the motorman, who will write the same plainly, and without unauthorized abbreviation, on the blank provided for that purpose, with sufficient copies for each member of the crew, and when he has finished writing the order the motorman will read it to the dispatcher, who will complete the same, if correct, by giving the initials of the superintendent, or other designated authority, and the time of completion. The motorman will thereupon write upon the order the word "complete," with the time given, and his last name in full, and deliver a copy to each person addressed. Each person in turn will read the order aloud to the motorman.

If for any reason the line should fail before the dispatcher completes an order, it is of no effect, and must then be treated as though it had not been given.

Issuing Orders at Stations.

258. To issue orders at stations where there are operators

or agents, the dispatcher will instruct the operator or agent to display the stop signal for the motorman and conductor to stop [call] for orders. The motorman and conductor must not pass a station where such signals are displayed without reporting to the agent or train dispatcher, and until such signals have been taken down, removed or cleared.

When an order is given through an agent, he must read it back to the dispatcher, and complete it in the same manner as a motorman. The conductor and motorman receiving such an order must each read it aloud back to the agent, and receipt for the same by writing their names upon it before detaching the copies intended for them.

Call Dispatcher if Opposing Train has Not Arrived.

261. When any train reaches a meeting point and finds that the train or trains to be met have not arrived, the motorman [or conductor] shall immediately call the dispatcher for orders, as provided in Rule 256 [195]. If the train is a scheduled train, and the motorman is unable to reach the dispatcher, the train may proceed by flagging under Rule 203a, after waiting minutes, keeping in mind that the opposing train may be approaching at high speed.

Manifold Copies of Train Orders.

262. The person receiving [a] train orders must write [it] them in manifold during transmission, and if they cannot at one writing make the requisite number of copies, they must [trace] make others from one of the copies first made, but the same must be repeated back to the dispatcher same as first copy before being acted upon.

Train Orders in Effect.

267. Train orders once in effect continue so until fulfilled, superseded or annulled.

Any part of an order specifying a particular movement may be either superseded or annulled.

FORMS OF TRAIN ORDERS

Form A. Fixing Meeting Point for Opposing Trains.

- 277. (1) No.....Motor.....and No.....Motor..... meet at.....
- (2) No.....Motor.....meet No.....Motor.....atat....., and.....at.....

EXAMPLES

- (1) No. 1, Motor 201 and No. 2, Motor 202, meet at "A."
- (2) No. 3, Motor 203 and 2d No. 4, Motor 204, meet at "B."
- (3) No. 5, Motor 205 and Extra 65, east, meet at "C."
- (4) Extra 29, north, and Extra 72, south, meet at "D."
- (5) No. 1, Motor 29, meet 1st No. 2, Motor 33, at "B"; 2nd No. 2, Motor 38, at "C," and Extra 73, west, at "D."

Trains receiving this order will, with respect to each other, run to the designated point, and, having arrived there, will meet in the manner provided by the rules.

275. Form of Train Order Blank.

Form No. _____ Train Order No.....Date.....19..

TO CONDUCTOR & MOTORMAN:

.....Train No.....Car No.....At.....

.....Train No.....Car No.....At.....

.....Train No.....Car No.....At.....

.....Train No.....Car No.....At.....

Motorman.	Conductor.	Train No.	Time.	Made
.....
.....
.....

Form B. Authorizing a Train to Run Ahead of or Pass Another Train Running in the Same Direction.

- 278. (1) No.....Motor.....pass No.....Motor..... at.....
- (2) No.....Motor.....pass No.....Motor..... when overtaken.
- (3) No.....Motor.....run ahead of No.....Motor.....to.....
- (4) No.....Motor.....pass No.....Motor..... at.....and run ahead of No.....Motor.....,to.....

EXAMPLES

- (1) No. 1, Motor 201, pass No. 3, Motor 203, at "D."
- (2) No. 6, Motor 206, pass No. 4, Motor 204, when overtaken.
- (3) Extra 59, east, run ahead of No. 6, Motor 206, "M" to "B."
- (4) Extra 95, west, run ahead of No. 3, Motor 203, at "K" and run ahead of No. 7, Motor 207, "M" to "Z."

When under (1) a train is to pass another both trains will run according to rule to the designated point, and there arrange for the rear train to pass promptly.

Under (2) both trains will run according to rule until the second-named train is overtaken, and then arrange for the rear train to pass promptly.

Under (3) the second-named train must not exceed the speed of the first-named train between the points designated.

Under (4) the first-named train will run ahead of the second-named train from the designated station until overtaken, and then arrange for the rear train to pass promptly.

When an inferior train receives an order to pass a superior train, right is conferred to run ahead of the train passed from the designated point.

Form C. Giving Right to a Train Over an Opposing Train.

279. No. Motor has right over No. Motor to

EXAMPLES

- (1) No. 1, Motor 201, has right over No. 2, Motor 202, "G" to "X."
- (2) Extra 37, east, has right over No. 3, Motor 203, "F" to "A."

This order gives right to the train first named over the other train between the points named.

Under (2) the regular train must not go beyond the point last named until the extra train has arrived, unless directed by train order to do so.

Form F. For Sections of Scheduled Trains.

280. (1) Motor display signals and run as to

(2) No. Motor, run as, to

(3) No. Motor, display signals to for

(6) Motor is withdrawn as at

(7) Motor, instead of Motor, display signals and run as to

(8) No., and, reverse positions as and to

EXAMPLES

- (1) Motor 201 display signals and run as 1st No. 1, "A" to "Z."
- (2) Motor 250 run as 2d No. 1, "A" to "Z."
- (3) No. 101, Motor 205, display signals "A" to "G" for Motor 65; 2d No. 1 display signals "B" to "E" for Motor 99. These examples may be modified as follows:
- (4) Motors 20, 25 and 99 run as 1st, 2d and 3d No. 1, "A" to "Z."

Example (1) is to be used when the number of the motor for which signals are displayed is unknown, and is to be followed by example (2), both being single-order examples.

Under examples (2) and (3) the motor named will not display signals.

Under example (4) the motor last named will not display signals.

For changing sections:

To add an intermediate section, the following modification of example (1) will be used:

(5) Motor 85 display signals and run as 2d No. 1, "N" to "Z." Following sections change numbers accordingly.

Under (5) Motor 85 will display signals and run as directed, and following sections will take the next higher number.

To drop an intermediate section, the following example will be used:

(6) Motor 85 is withdrawn as 2d No. 1 at "H." Following sections change numbers accordingly.

Under (6) Motor 85 will drop out at "H," and following sections will take the next lower number.

To substitute one motor for another on a section, the following will be used:

(7) Motor 18, instead of Motor 85, display signals and run as 2d No. 1, "R" to "Z."

Under (7) Motor 85 will drop out at "R," and Motor 18 will run as directed.

If Motor 85 is last section, the words "display signals and" will be omitted. Following sections need not be addressed.

To discontinue the display of signals, the following example will be used:

(8) 2d No. 1 take down signals at "D." Under example (8) 2d No. 1 will take down signals as di-

rected, and a following section must not proceed beyond the point named.

To pass one section by another, the following will be used: (9) Motors 99 and 25 reverse positions as 2d and 3d No. 1, "H" to "Z," and, if necessary, both motors will arrange signals accordingly. Following sections, if any, need not be addressed.

The character of a train for which signals are displayed may be stated. Each section affected by the order must have copies, and must arrange signals accordingly.

To annul a section for which signals have been displayed over a division, or any part thereof, when no train is to follow the signals, Form K must be used.

Form G. Extra Trains.

281. (1) Motor run extra to

(2) Motor run extra to and return to

EXAMPLES

- (1) Motor 99 run extra "A" to "F."
 - (2) Motor 99 run extra "A" to "F" and return to "C."
- Under (2) the extra must go to "F" before returning to "C."
- (3) Motor run extra, leaving on as follows, with right over all trains.

Leave
Leave
Arrive

EXAMPLES

(3) Motor 77 run extra, leaving "A" on Thursday, February 17th, as follows, with right over all trains:

Leave "A" 11.30 p. m.
" " "C" 12.25 a. m.
" " "E" 1.47 a. m.
Arrive "F" 2.22 a. m.

This order may be varied by specifying the kind of extra and the particular trains over which the extra shall or shall not have right.

Trains over which the extra is thus given right must clear the time of the extra minutes

Form H. Work Extra.

282. (1) Motor works until between and

EXAMPLES

(1) Motor 292 works 7 a. m. to 6 p. m. between "D" and "E"

Under (1) the work extra must, whether standing or moving, protect itself against extras within the working limits in both directions as prescribed by rule. The time of regular trains must be cleared.

This may be modified by adding:

- (2) Not protecting against (eastward) extras.
- (3) Not protecting against extras.

Under (2) the work extra will protect only against (westward) extras. The time of regular trains must be cleared.

Under (3) protection against extras is not required. The time of regular trains must be cleared.

When a work extra has been instructed by order to not protect against extra trains, and, afterward, it is desired to have it clear the track for (or protect itself after a certain hour against) a designated extra, an order may be given in the following form:

(4) Work extra 292 clears (or protects against) extra 76, east, between "D" and "E" after 2.10 p. m.

Under (4) extra 76, east, must not enter the working limits before 2.10 p. m., and will then run, expecting to find the work extra clear of the main track (or protecting itself), as the order may require.

To enable a work extra to work upon the time of a regular train, the following form will be used:

(5) Work extra 292 protects against No. 55 (or class trains) between "D" and "E."

Under (5) the work extra may work upon the time of the train or trains mentioned in the order, and must protect itself against such train or trains, as prescribed by Rule The regular train or trains receiving the order will run, expecting to find the work extra protecting itself.

When a work extra is to be given exclusive right over all trains the following form will be used:

(6) Work extra 292 has right over all trains between the points designated between the times named.

Work extras must give way to all trains as promptly as practicable.

Whenever extra trains are run over working limits they must be given a copy of the order sent to the work extra. Should the working order instruct a work extra to not protect against extra trains in one or both directions, extra trains must protect, as prescribed by Rule, against the work extra; if the order indicate that the work extra is protecting itself against other trains, they will run, expecting to find the work extra protecting itself.

The working limits should be as short as practicable, to be changed as the progress of the work may require.

Form J. Holding Order.

283.
Hold.....

EXAMPLES

Hold No. 2.

Hold all (or westward) trains.

When a train has been so held it must not proceed until the order to hold is annulled, or an order given to the operator in the form:

"..... may go."

These orders will be addressed to the operator and acknowledged in the usual manner, and will be delivered to conductors and motormen of all trains affected.

Form J will only be used when necessary to hold trains until orders can be given, or in case of emergency.

Form K. Annulling a Schedule or a Section.

284.
.....of.....is annulled.....to.....

EXAMPLES

No. 1 of Feb. 29th is annulled "A" to "Z."

2d No. 5 of Feb. 29th is annulled "E" to "G."

The schedule or section annulled becomes void between the points named and cannot be restored.

Form L. Annulling an Order.

285.
Order No. is annulled.

EXAMPLE

Order No. 10 is annulled.

If an order which is to be annulled has not been delivered to a train, the annulling order will be addressed to the operator, who will destroy all copies of the order annulled but his own, and write on that:

Annulled by Order No.

An order which has been annulled must not be reissued under its original number.

Form M. Annulling Part of an Order.

286.
That part of Order No., reading....., is annulled.

EXAMPLE

That part of Order No. 10, reading No. 1 meet No. 2 at "S," is annulled.

Form P. Superseding Order or a Part of Order.

287. This order will be given by adding to prescribed forms the words, "instead of....."

(1) No.....Motor.....meet No.....Motor.....at.....instead of.....

(2) No.....Motor.....has right over No.....Motor.....,.....to.....instead of.....

(3) No.....Motor.....display signals for Motor.....,.....to.....instead of.....

EXAMPLES

(1) No. 1, Motor 50, meet No. 2, Motor 55, at "C" instead of "B."

(2) No. 1, Motor 60, has right over No. 2, Motor 65, "G" to "R" instead of "X."

(3) No. 1, Motor 70, display signals for Motor 85, "A" to "Z" instead of "G."

The order which has been superseded must not be reissued under its original number.

Form R. Providing for a Movement Against the Current of Traffic.

288. No.....Motor.....has right over opposing trains on.....track.....to.....

EXAMPLE

(1) No. 1, Motor 50, has right over opposing trains on No. 2 (or eastward) track "C" to "F."

A train must not be moved against the current of traffic until the track on which it is to run has been cleared of opposing trains.

Under this order the designated train must use the track specified between the points named, and has right over opposing trains on that track between those points. Opposing trains must not leave the point last named until the designated trains arrive.

An inferior train between the points named moving with the current of traffic in the same direction as the designated train must receive a copy of the order, and may then proceed on its schedule by right.

This order may be modified as follows:

(2) After No.... Motor.....arrives at.....No..... Motor.....has right over opposing trains on.....track,.....to.....

EXAMPLE

After No. 4, Motor 54, arrives at "C," No. 1, Motor 51, has right over opposing trains on No. 2 (or eastward), track "C" to "F."

Under (2) the train to be moved against the current of traffic must not leave the first-named point until the arrival of the first-named train.

Form S. Providing for the Use of a Section of Double Track as Single Track.

280.track will be used as single track between.....and..... If it is desired to limit the time for such use, add (from.....until.....)

EXAMPLE

No. 1 (or westward) track will be used as single track between "F" and "G." Adding, if desired, "from 1 p. m. to 3 p. m."

CONDUCTORS

Signal to Start.

398. Conductors must never get a signal to start unless they can see the rear steps and know that passengers leaving the train are clear of same, or that passengers boarding the train are safely on the car. They must be careful not to give a starting signal when passengers are approaching, or close to a train and about to board it. [When flagging railroad crossings, conductors will keep the rear door closed, opposite to the side of the car from which they will flag crossing.]

Display of Signals.

399. Display proper markers [signals] at rear of train and have all appliances ready for use.

ACCIDENT AND PERSONAL INJURY

Immediate Report.

421. Conductors and motormen will make immediate verbal report to the dispatcher of any accident, blockade or serious mishap of any kind. (See Rule 24.)

EXHIBITORS AT THE DENVER CONVENTION

The following list gives the names of all companies from which applications for exhibit space at the Denver convention had been received by the committee on exhibits of the Manufacturers' Association up to July 31, 1909:

A. & J. M. Anderson Manufacturing Company, Boston.
Automatic Ventilator Company, New York.
American Brake Shoe & Foundry Company, Mahwah, N. J.
Allis-Chalmers Company, Milwaukee, Wis.
Anglo-American Varnish Company, Newark, N. J.
American Steel & Wire Company, Chicago, Ill.
Black Diamond Boring Company, Monongahela, Pa.
Berry Brothers, Detroit, Mich.
H. P. Brown, New York.
Buda Foundry & Manufacturing Company, Chicago, Ill.
The J. G. Brill Company, Philadelphia, Pa.
Burrongs Adding Machine Company, Detroit, Mich.
Bayonet Trolley Harp Company, Springfield, Ohio.
Badger Fire Extinguisher Company, Boston, Mass.
Curtain Supply Company, Chicago, Ill.
Carnegie Steel Company, Pittsburgh, Pa.
Climax Railway Supply Company, Chicago, Ill.
Consolidated Car Fender Company, Providence, R. I.
Coin Counting Machine Company, Chicago, Ill.
Consolidated Car Heating Company, New York.
Chicago Varnish Company, Chicago, Ill.
Cincinnati Car Company, Cincinnati, Ohio.
Crouse-Hinds Company, Syracuse, N. Y.
Chisholm & Moore Manufacturing Company, Cleveland.
Chicago Car Heating Company, Chicago, Ill.
Duff Manufacturing Company, Pittsburgh, Pa.
Duplex Metals Company, New York.
Dearborn Drug & Chemical Company, Chicago, Ill.
Emery Pneumatic Lubricator Company, St. Louis, Mo.
ELECTRIC RAILWAY JOURNAL, New York.
Electric Service Supplies Company, Philadelphia, Pa.
Electric Renovator Manufacturing Company, Pittsburgh.
Eureka Tempered Copper Works, North East, Pa.
O. M. Edwards Company, Syracuse, N. Y.
Electric Railway Improvement Company, Cleveland, Ohio.
Forsyth Steel Tie Company, Pittsburgh, Pa.
Galena-Signal Oil Company, Franklin, Pa.
General Electric Company, Schenectady, N. Y.
Globe Ticket Company, Philadelphia, Pa.

Griffin Wheel Company, Chicago, Ill.
 Goldschmidt Thermit Company, New York.
 Heywood Brothers & Wakefield Company, Wakefield, Mass.
 International Register Company, Chicago, Ill.
 W. J. Jeandron, New York.
 Kenfield Publishing Company, Chicago, Ill.
 Lorain Steel Company, Philadelphia, Pa.
 McConway & Torley Company, Pittsburgh, Pa.
 McCord & Company, Chicago, Ill.
 National Carbon Company, Cleveland, Ohio.
 Niles-Bement-Pond Company, New York.
 National Brake Company, Buffalo, N. Y.
 National Lock Washer Company, Newark, N. J.
 Ohio Brass Company, Mansfield, Ohio.
 Ohmer Fare Register Company, Dayton, Ohio.
 Pennsylvania Steel Company, Steelton, Pa.
 Rail Joint Company, New York.
 Sherwin-Williams Company, Cleveland, Ohio.
 Speer Carbon Company, St. Marys, Pa.
 Standard Varnish Company, New York.
 Stromberg-Carlson Telephone Mfg. Co., Rochester.
 T. H. Symington Company, Baltimore, Md.
 Star Brass Company, Kalamazoo, Mich.
 Tool Steel Motor Gear & Pinion Company, Cincinnati.
 Trolley Supply Company, Canton, Ohio.
 Under-Feed Stoker Company, Chicago, Ill.
 W. T. Van Dorn Company, Chicago, Ill.
 Wonham, Magor & Sanger, New York.
 Wheel Truing Brake Shoe Company, Detroit, Mich.
 Western Electric Company, New York.
 William Wharton, Jr., & Company, Inc., Philadelphia, Pa.
 Westinghouse Companies, Pittsburgh, Pa.
 Wagner Electric Manufacturing Company, St. Louis, Mo.

CONVENTION PROGRAM

The following program of the Denver convention has been announced:

MONDAY, OCT. 4

8:00 a. m.—Opening of exhibits of Manufacturers' Association.
 9:00 a. m.—Registration and issuance of badges at Auditorium.
 2:00 p. m.—Session of Claim Agents' Association.
 2:00 p. m.—Session of Transportation & Traffic Association.

TUESDAY, OCT. 5

9:30 a. m.—Session of Claim Agents' Association.
 9:30 a. m.—Session of Transportation & Traffic Association.
 2:00 p. m.—Session of American Association.
 2:00 p. m.—Session of Engineering Association.
 2:00 p. m.—Session of Claim Agents' Association.

WEDNESDAY, OCT. 6

9:30 a. m.—Session of Engineering Association.
 9:30 a. m.—Session of Transportation & Traffic Association.
 9:30 a. m.—Session of Accountants' Association.
 9:30 a. m.—Closing session of Claim Agents' Association.
 2:00 p. m.—Session of American Association.
 2:00 p. m.—Session of Engineering Association.

THURSDAY, OCT. 7

9:30 a. m.—Session of Accountants' Association.
 9:30 a. m.—Closing session of Transportation & Traffic Association.
 2:00 p. m.—Closing session of American Association.

FRIDAY, OCT. 8

9:30 a. m.—Session of Engineering Association.
 9:30 a. m.—Closing session of Accountants' Association.
 2:00 p. m.—Closing session of Engineering Association.

ENTERTAINMENT FEATURES

General direction of the entertainment features during convention week is in the hands of Charles C. Peirce, vice-president of the Manufacturers' Association, and A. L. Whipple, chairman of the entertainment committee. As usual, a pleasing variety of entertainment will be provided, including (according to the tentative plans so far made) an informal entertainment for Monday night, Oct. 4; re-

ception to the officers of the associations on Tuesday night; annual supply men's vaudeville on Wednesday night; grand ball on Thursday night, and trip over the celebrated Moffat Road on Friday. Special arrangements will be made for afternoon entertainments for the ladies, including a trip around the city, afternoon at country club, etc. The ELECTRIC RAILWAY JOURNAL Convention Dailies will publish the correct programs of the day's entertainment each morning.

DETAILED PROGRAMS OF AFFILIATED ASSOCIATIONS

The detailed program of the Transportation & Traffic Association was published in the ELECTRIC RAILWAY JOURNAL for July 24, and the list of topics to be considered by the Claim Agents' Association was printed in the issue of June 26. It is understood that these topics will be taken up in consecutive order until they have been disposed of. The following tentative programs have been drawn up by the Accountants' and Engineering Associations:

ACCOUNTANTS' ASSOCIATION

Wednesday Morning

Convention called to order.
 Annual address of president.
 Annual report of executive committee.
 Annual report of secretary-treasurer.
 Paper—"Interurban Statistics," by S. C. Rogers, treasurer and secretary, Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.
 Appointment of convention committees.
 New business.
 "Get-together Luncheon."

Thursday Morning

Paper—"The Census and Electric Railway Statistics," by W. M. Steuart, chief statistician for manufactures, Bureau of Census, Washington, D. C.
 Paper—"Place of the Accountant in an Electric Railway Organization," by W. B. Brockway, general auditor, Birmingham Railway, Light & Power Co., Yonkers, N. Y.
 Paper—"Payrolls and Timekeeping," by N. E. Stubbs, auditor, United Railways & Electric Company, Baltimore.
 Report of committee on interline accounts.
 Report of committee on standard classification of construction and equipment accounts and form of report.

Friday Morning

Paper—"Storeroom Accounting and Inventory," by E. S. Pattee, secretary and comptroller, Twin City Rapid Transit Company, Minneapolis, Minn.
 Report of joint committee on shop accounting.
 Report of nominating committee.
 Election of officers.
 Installation of officers.
 Adjournment.

ENGINEERING ASSOCIATION

Tuesday Afternoon

Convention called to order.
 Annual address of president.
 Annual report of executive committee.
 Annual report of secretary-treasurer.
 Appointment of convention committees.
 Report of committee on way matters.

Wednesday Morning

Report of committee on equipment.

Wednesday Afternoon

Report of committee on power generation.
 Appointment of nominating committee.

Thursday

Inspection of exhibits.

Friday Morning

Report of committee on standards.
 Report of committee on power distribution.

Friday Afternoon

Question box.
 General business
 Report of nominating committee.
 Election of officers.
 Installation of officers.
 Adjournment.

NEW REPULSION MOTOR FOR RAILWAY WORK

Brown, Boveri & Company, of Baden, Switzerland, have recently brought out a single-phase repulsion railway motor of the Deri type, which is a modification of a motor of the same type built by the manufacturers and in experimental use on the Stansstad Engelberg Railway. A list of the contracts which the manufacturers have closed for this new type of motor is shown in the accompanying table.

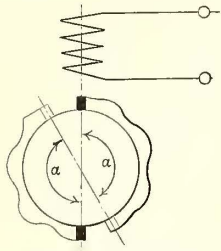


Fig. 1—Deri Motor

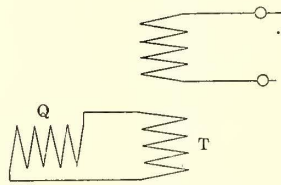


Fig. 2—Equivalent Electrical Circuits

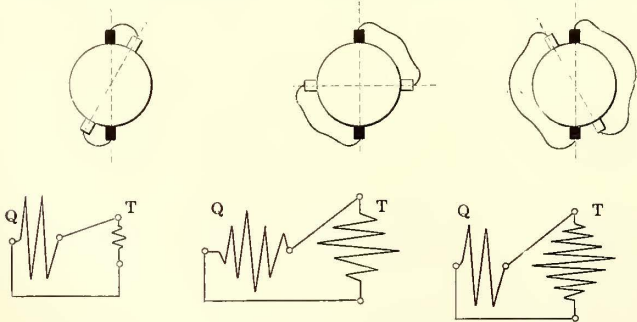
Electric Ry. Journal

As the Deri type of single-phase motor has not been used in this country to any great extent, a short account of the principles on which it operates will be of interest.

The motor consists of a single stationary primary winding and a revolving secondary winding, short-circuited upon itself along certain axes which are stationary with respect to the primary magnetism. It differs from the plain (Thomson) repulsion motor in requiring twice as many brushes on the commutator. These brushes are short-circuited in pairs.

A diagram of the motor is given in Fig. 1, which shows the scheme for arranging the brushes and inter-connecting them in a two-pole model. The two brushes in line with the stationary primary coil are held stationary in space, while the other two are shifted manually for varying the torque. This produces on each side of the armature a pulsating torque the net result of which is to tend to turn the armature in a common direction. The value of the torque depends not only upon the current, the magnetism in space-quadrature therewith and the cosine of the time-angle between the two, but also upon the space distribution of the coils in which the secondary current is produced.

In dealing quantitatively with the physical relations, it is convenient to consider that the armature winding is divided into two completely superposed armature windings receiving current along two axes separated by an angle equal to the space-angle spanned by the coils actually short-circuited



Figs. 3, 4 and 5—Equivalent Electrical Circuits

Electric Ry. Journal

between the brushes. Evidently, the actual condition relating to the current values will be faithfully represented if each superposed winding is assumed to receive a current equal in value to one-half of the real current in the armature coils. Under the assumed conditions the coils spanned by the brushes will carry the full value of current, while

the others will be free from current. One of the assumed superposed armature windings has its axis in line with the primary field magnetism, and hence it may be called the transformer winding. The other superposed winding occupies a position depending upon the adjustment of the brushes, but a certain component of the effect produced by the current in this winding is in space-quadrature with the primary field magnetism—the other component being in direct space-opposition therewith, and hence this winding may be called the quadrature coil.

On the basis of the above assumption the connection of a Deri repulsion motor with two brush axes in space-quadrature can be represented as shown in Fig. 2. Any flux produced by the current in the "quadrature" winding will be in time-phase with the current in the transformer winding, and will produce accelerating torque at the rotor. The time-place relation between the current in the transformer winding and the flux in space-quadrature therewith will not be altered by any motion of the rotor or change in its speed.

Figures 3, 4 and 5 indicate three positions of the brush axes and show the equivalent connections for the "transformer" and "quadrature" windings on the motor. With the axes close together, the transformer opposing compo-

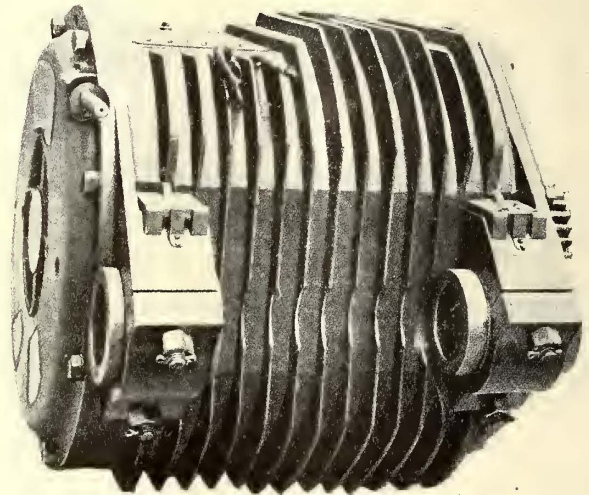


Fig. 6—New Single-Phase Repulsion Motor

nent of the "quadrature" winding is large, so that the resultant "transformer" winding is small, even in comparison with the fairly small space-quadrature component of the "quadrature" winding. With a wider separation of the axes the "transformer" winding produces a greater effect in comparison with the "quadrature" winding.

Both when the axes are together and when they are separated by 180 electrical space degrees the torque is zero. In the former case the transformer effect is zero, while in the latter case there is no quadrature effect.

Under speed condition there are produced two e.m.f.s., which affect the value of the secondary current and therefore alter the torque, which for each position of the brushes varies directly with the square of the current in the armature. One e.m.f. appears at the "transformer" axis and the other at the "quadrature" axis; the former is proportional to the product of the speed and the quadrature flux, and the latter varies directly with the product of the speed and the transformer (primary) flux. In any event, there two e. m. f.'s have such values and time-place position as to tend to decrease the armature current with increase of speed.

It will be seen from the above that the machine pos-

sesses the speed-current and speed-torque characteristics of the direct-current series motor with constant primary e.m.f. and at any set position of the brushes the current decreases with increase of speed, while the torque varies with the square of the current. With the brushes in a constant position, at any chosen speed the current varies directly with the e.m.f., but the torque varies only with the square of the current independently of the e.m.f. or the speed at which it may be produced. With constant impressed primary e. m. f. at any given speed the current, the torque and the relation between the current and the torque can be varied throughout a wide range by merely shifting the brushes, as explained above.

Owing to its construction, it is possible to connect the primary winding directly to the high-tension circuit, thus eliminating the necessity for a transformer. Moreover, the regulation of speed, torque and direction of rotation is obtained without the use of a resistance, by the mere move-

NEW CARS FOR THE CHICAGO & MILWAUKEE ELECTRIC RAILROAD COMPANY

The St. Louis Car Company has recently delivered to the Chicago & Milwaukee Electric Railroad Company 10 "pay-on-platform" type cars for operation in and about Milwaukee. These cars were designed jointly by the St. Louis Car Company and A. W. McLimont, general manager, and L. L. Smith, master mechanic, of the Chicago & Milwaukee Railroad Company.

The bodies are 34 ft. long over cornerposts, and 49 ft. 2 in. over bumpers. The width over all will be 8 ft. 8 in. The platforms are 7 ft. 3 in. in length, and are provided with the Birney "pay-on-platform" arrangement.

The doors in the body of the cars are of the twin type, operating singly, with a door opening 5 ft. wide, which gives ample room for ingress and egress of passengers when the swinging gate is in its normal position. The



Prepayment Car for City and Suburban Service in and Around Milwaukee, Wis.

ment of the brushes. Thus the machine operates at high efficiency during acceleration, and the acceleration can be made as gradual as desired.

No information has been made public by the manufacturers as to methods for reducing sparking under starting conditions.

STATISTICS OF BROWN-BOVERI REPULSION MOTORS IN USE OR UNDER CONTRACT.

Line.	Number of loco-motives or motor cars.	Number of motors per machine.	Power of each motor in hp.	Voltage.	Frequency.	Speed of motor in r.p.m.	Length of line in km.
Baden State Railways, Wiesental	2	2	500	500	15	225	49.1
Seetal Railway, Switzerland	2	2	50	500	25	600	..
Martigny-Orsières Railway, Switzerland... 4	4	2	80	500	15	450	19
Parma Tramways, Italy 20	20	2	15	400	25	500	10.5
Buer Mine..... 1	1	2	5	150	50	1,000	..
E. W. Mark Switching Service	1	2	40	1,000	50	500	..

bottom framing of the cars is of the St. Louis Car Company's channel-iron construction. The side panels are straight, with inside sheathing of yellow poplar, covered on the outside with heavy sheet steel.

The seats are of the St. Louis Car Company's K type, covered with rattan, and the interior finish is of birch, stained mahogany. The sliding door in the vestibule is operated by an entirely new mechanism, designed by W. S. Miller, works manager of the St. Louis Car Company. This mechanism operates the folding step on the exit side of the front vestibule. This device has recently been patented.

The curtains are of Pantasote, and the glass in all side and end windows is double-strength AA. Florentine glass is used in the deck sashes.

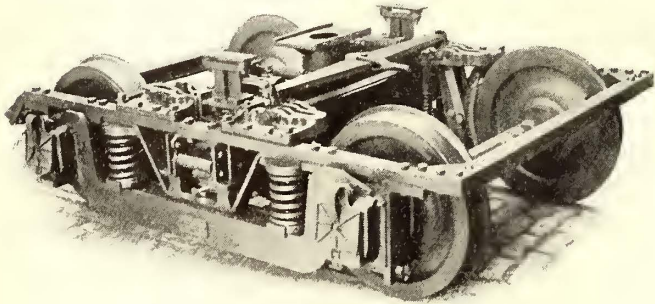
Fenders of the Chicago City Railway disappearing type are provided at each end of the cars, built and installed by the St. Louis Car Company. Six of these cars are now in operation.

The Manhattan Bridge, spanning the East River about half-way between the Williamsburgh Bridge and the Brooklyn Bridge, will be completed and open for traffic early in 1910. It will carry four subway car tracks on the lower deck and four surface car tracks on the upper deck.

The *Daily Arkansas Democrat* recently contained an interesting popular article on the work of the Little Rock Railway & Electric Company, Little Rock, Ark., illustrated with views along the company's line and in Forest Park, the terminal of the company's line.

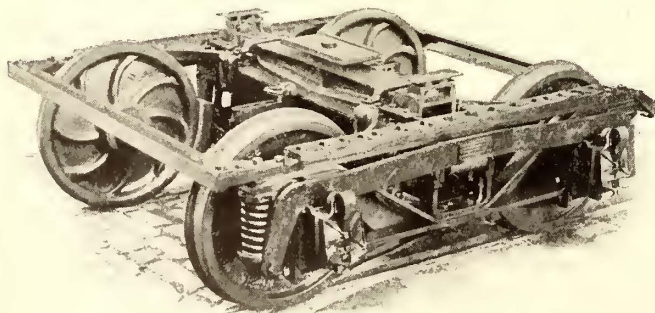
NEW DESIGNS OF ELECTRIC MOTOR AND TRAILER TRUCKS

The accompanying engravings illustrate two types of electric trucks recently built by the Baldwin Locomotive Works. The truck for the United Railways of Portland, is one of eight built for this road, and is designated by the builders as class 78-30-A. It is built for standard-gage track, and is designed for a center-pin load of 30,000 lb. The wheelbase is 78 in., which allows ample room for two inside-hung Westinghouse 112-B motors. The truck is of the equalized pedestal type, and the general design of its



Motor Truck for United Railways of Portland

details is in accordance with American Street & Interurban Railway Engineering Association standards. The equalizing beams are punched from steel boiler plates; the pedestals and side frames are of forged iron, while the end frames consist of 3-in. x 3-in. angles. The connections between the side and end frames are strengthened by gusset plates, and the result is an exceedingly stiff construction, while at the same time the frame can be readily dismantled if necessary. The transoms consist of steel channels secured to the side frames by substantial cast-steel gussets. These gussets also serve as brake lever guides and brake-hanger supports, and to them are bolted chafing plates which prevent the bolster from bearing directly against the transoms. The equalizing beam springs are double coil, while the springs supporting the bolster are double elliptic. The bolster is a steel casting, suspended on swing links in accordance with the usual practice. The wheels were manufactured by the Standard Steel Works Company. They are forged and rolled steel, 33 in. in diameter, with rims



Trailer Truck for Chicago & Southern Traction Company

3 in. thick. The journals are 5 in. x 9 in. The brake is arranged with a transverse beam, connected directly to the upper ends of the live levers, and actuated by a central pull rod which extends over the motor. The release springs are attached to the transverse beam.

The second engraving shows one of eight trailer trucks built for the Chicago & Southern Traction Company. These trucks are classified by the builders as 60-22-T, and are

designed for standard-gage track, to be used in interurban service. The wheelbase is 5 ft., and the maximum center-pin load 22,000 lb. The truck frame is supported by two coiled springs on each side. These springs are suspended from the ends of the equalizers, and as the latter extend beyond the truck boxes a long spring base is provided. This arrangement, in conjunction with the use of double-elliptic springs under the bolster, assures easy riding qualities. The angle-iron end frame, which has proved so efficient on motor trucks, is used in this design also. The bolster is a steel casting, hung on swing links. The wheels are of cast iron, with chilled treads, 33 in. in diameter; while the journals are $4\frac{1}{4}$ in. x 8 in. The side frames are strongly reinforced between the boxes, and are united to the transoms by cast-steel gussets, as in the truck previously described.

LARGE RAILWAY CONTRACT FOR ELECTRICAL ENERGY

On July 30, after negotiations extending over a considerable period of time, the Chicago Railways Company, which operates the surface street railways on the north side and west side of Chicago, entered into contract with the Commonwealth Edison Company for a large portion of the electrical energy needed to operate its cars. The contract calls for not less than 30,000 kw of electrical energy, and will cover a period of about six years. The rate is \$15 per kilowatt of maximum demand per year, with an additional current consumption charge of 0.415 cent per kw-hour until Jan. 31, 1910. After that date the current consumption charge will be 0.4 cent per kw-hour for the remainder of the period. In its provisions the contract is substantially the same as the one previously entered into by the Chicago City Railway Company and the Commonwealth Edison Company for a similar service and for about the same amount of electrical energy. The Commonwealth Edison Company does a remarkably large business in the way of supplying electrical energy at wholesale rates to electric railway companies in and near Chicago. Under existing contracts, at the time of maximum demand next winter the Commonwealth Edison Company will be supplying about 80,000 kw to customers of this character—a record significant of the modern expansion of the business of supplying electricity.

Ramona Park, the resort of the Grand Rapids Railway Company, at Reed's Lake, one mile east of Grand Rapids, recently has undergone some improvements. A large tract of land along the lake front has been transformed into a free playground for children, and swings, seesaws and slides have been installed. A caretaker is employed to see that none of the little ones are hurt while at play.

At a recent meeting of the Chicago Electric Club Edward N. Lake, division engineer of the Board of Supervising Engineers of Chicago, gave an interesting address on the subject, "Some Phases of Steam Railroad Electrification." Mr. Lake briefly reviewed the growth of electric railway systems in the United States. In 1890 there were 8123 miles of single-track street railways in the United States, of which 15.5 per cent or 1262 miles were operated by electricity. In 1907 there were 34,404 miles of street railways in the United States, of which 99 per cent or 34,060 miles were operated by electricity. Mr. Lake predicted that within the next 10 years New York City and Chicago will be zone centers for great activity in the line of electrification of steam railroads.

News of Electric Railways

Transit Affairs in New York

The absence from New York of several members of the Public Service Commission of the First District resulted in hearings being deferred on several street railway matters recently. The question of the 5-cent fare to Coney Island was put over until Wednesday, Aug. 11. The matter of the character, extent, location and value of the structure, facilities and property of the Third Avenue Railroad was also considered on Aug. 11. Several other matters affecting the electric railways were also before the commission during the week commencing on Aug. 9, among them the application for a reduction of the stock of the Long Island Electric Railway and the application of the Third Avenue Bridge Company for a certificate of convenience for a railway across the Queensboro Bridge to Long Island City.

The Public Service Commission is making a determined effort to arrange with property owners along the route of the proposed Broadway-Lexington Avenue subway for the installation of the entrances and exits to the stations through private property, after the manner of the new Washington Street subway in Boston, instead of by kiosks on the sidewalks. Commissioner Maltbie, who is looking after the matter, said recently:

"The commission has met with quite general success in obtaining consents of property owners to the plan of double-decking the Lexington Avenue line, which is of such advantage from the point of view of property owners. The obtaining of those consents now stands in the way of the advertising of contracts, and the commission is urging property owners to send in these consents as rapidly as possible, so that progress may be rapidly made."

Commissioner Bassett has returned from a tour of the Middle West, where he studied local public service problems at close range. Mr. Bassett is more than ever convinced that the day of perpetual franchises for public service corporations is passed and that the indeterminate franchise, which is favored by the Public Service Commission, is superior to the fixed term grant and is the best form of franchise for public service corporations. Mr. Bassett was accompanied by A. C. Duncan, his private secretary, and visited Buffalo, Niagara Falls, Toronto, Detroit, Chicago, Milwaukee, St. Paul, Minneapolis, Cleveland and Toledo.

Commenting on what he had observed, Mr. Bassett called particular attention to the low cost of power in Buffalo and Chicago, the first a water-power development and the latter steam, and referred to the peculiarities of the systems in Milwaukee and Minneapolis, and the franchise questions which are up for settlement in Toledo, Detroit and Cleveland. Much that Mr. Bassett said in an interview after his return is of general interest only, but his comments in regard to Toronto and Detroit are especially significant, his criticism of Toronto showing how a city may defeat its own ends by burdensome enactments. Mr. Bassett said:

"The street railways in Toronto are all owned by one company operating under definite-term franchises from the city. Under these franchises, the city receives cash payments of \$800 for every mile of track operated and also 12 per cent of the annual gross income of the company. Thus a large part of the company's earnings goes into the city treasury, but the result works against the interests of the community in this way: The city is growing and more street car lines are needed, especially in the suburbs. The company does not wish to increase its mileage on account of the payments required by its franchises. It does desire extensions of trackage in the built-up portions of the city, but the administration will not give it the right to build these extensions until the lines needed in the suburbs are built. The result is that the mileage is small and inadequate. This is concrete proof of the wisdom of the stand taken by the Public Service Commission in New York City—that franchises which provide for too large cash payments into the city treasury regardless of net earnings and adequacy of service are bad and tend to prevent corporations receiving such franchises from providing extensions and good service.

"In Detroit I found that a single corporation, the Detroit United Railway Company, operates the entire surface car system. On most of the lines the fare is 5 cents, but on some a fare of 3 cents is charged. During the last few years a fight has been waged in all of the three Lake Erie cities, Detroit, Toledo and Cleveland, for a 3-cent fare with universal transfers, and there is a large sentiment in favor of it. The Detroit franchises are for fixed terms—and I

might say here that in few of the cities outside of New York State did I find any of the so-called perpetual franchises, such as prevail in New York, in existence. These fixed-term franchises will be expiring from time to time in the near future and the city of Detroit is anxious to make the best possible terms for the new grants which will be made upon their expiration. Mayor Breitmeyer has appointed a committee of 50 citizens to appraise the traction property and to propose a plan for the extension or re-letting of the present franchises. While this is going on there is no incentive to the company to improve or extend its system. This condition is the invariable result of limiting franchises to a fixed term. As the time of expiration draws near, the operating companies are apt to allow their structure and equipment to deteriorate because they do not wish to incur expenditure for extensions and improvements in view of the approaching termination of their grants and the possibility of losing their franchises."

The Interborough Rapid Transit Company proposes to change the color scheme of 1600 cars in use on the elevated lines from the prevailing color of red to olive green. Three cars were recently painted in the company's shops, one with the present coloring, one with what is known as the Alton standard—the same color used on the coaches of the Chicago & Alton Railroad—and the third, olive green, or what is known as the Pullman standard color. The last was finally decided upon as being the most serviceable.

The commission has set Sept. 8 for a hearing on the question whether an extension of the elevated structure to the proposed Eastern Parkway in Brooklyn shall be erected on the assessment plan provided in the Travis-Robinson amendment to the Rapid Transit act. This is the first matter to come up involving the construction of rapid transit facilities to the plan of assessing the cost wholly or in part on the property benefited.

Theodore P. Shonts, president of the Interborough Rapid Transit Company, has announced that his company will not build any more subways if the Broadway-Lexington Avenue route, favored by the Public Service Commission, is constructed. Mr. Shonts regards that proposed line as an "isolated independent route, wholly on the East Side, with no transfer connections, and which would not touch the hotel, theater and shopping districts." The plans submitted by the Interborough, on the other hand, he contends, provide for "a comprehensive unified transit system for the city with transfers between the elevated and subway lines and the longest ride in the world for 5 cents."

Mr. Bassett, of the commission, has replied that there is nothing to prevent the Interborough Rapid Transit Company from bidding for the Broadway-Lexington Avenue system and, in fact, its lease of the present subway and its ability to issue transfers between the present subway and the new subway would give it an advantage over other bidders. The commission, however, is authorized under the law to take this matter of transfers into consideration in awarding the contract. Furthermore, the commissioner stated, the extension proposed by the Interborough Rapid Transit Company would by no means meet the needs of the city for the next 25 years. The Interborough Rapid Transit Company's plan, according to Mr. Bassett, does not provide for the Broadway-Lafayette route in Brooklyn, which is designed to provide for a constantly expanding traffic, or the construction of a Fourth Avenue subway or of a subway along the Eastern Parkway. Neither does it provide for additional tunnels under the river or for an additional East Side line in Manhattan.

Judge Lacombe, in the United States Circuit Court, has issued an order giving Adrian H. Joline and Douglas Robinson, receivers of the Metropolitan Street Railway, permission to make expenditures out of current earnings for improvements on the company's car houses at Lenox Avenue and 146th Street, Ninth Avenue and Fifty-fourth Street, and elsewhere in the city. The Morton Trust Company, as trustee of the refunding mortgage of the Metropolitan Street Railway of 1902, objected to making any of these expenditures beyond such as were required to keep the car houses in working condition, because the real estate in question is pledged under the collateral trust mortgage of 1807, of which the Guaranty Trust Company is trustee, and claiming that if the receivers improved these car houses out of current earnings they favored unduly those whose interest in the property came through the collateral trust bonds of 1807, and discriminated against the holders of the refunding bonds of 1902. In his decision Judge Lacombe said that the Morton Trust Company seemed to assume that there would be a complete disruption of the property,

which assumption, he declared, the receivers were not entitled to act upon. That being the case, and as the mortgage of the Morton Trust Company covers the entire property of the Metropolitan Street Railway, subject to the prior lien of the Guaranty Trust mortgage on certain specified parcels, Judge Lacombe took the position that the expenditures benefited everybody interested in the property. The receivers altogether want to spend \$394,205 on these ear houses, and when the work is completed the receivers will have spent on repairs, alterations and rebuilding of ear houses \$1,784,498.

Bridge Commissioner James W. Stevenson has received from the engineer in charge of traffic on the Brooklyn Bridge a report showing the number of trolley cars operated over the bridge during afternoon rush hours throughout the month of July. Saturdays, Sundays and holidays are omitted from the computation. The daily average from 5 p. m. to 6 p. m. was 329, against 293 in 1908. The daily average from 6 p. m. to 7 p. m. was 279, against 265 in 1908. The average number of cars operated during the 5 p. m. to 6 p. m. rush hour was the highest monthly average ever operated over the bridge for any single hour, and is 36 cars more than were operated the same period in 1908.

Annual Convention of the German Street Railway Association.—The twelfth annual convention of the German Street & Interurban Railway Association will be held at Hamburg on Sept. 8, 9 and 10. Among the subjects to be discussed are the following: "Recent Legislation Relative to Accident Damage Claims," "Specifications for Rails and Other Parts of Track Construction," "Standardization of Rail Sections," "Track Construction in Paved Streets," "Rail Corrugation," "Welded Joints," "Snow Plows," "Cars for Mixed Service on Trolley Lines and Highways," "Improvements in Traction Motors," "Welfare of Employees," "Methods of Printing Tickets."

Club Houses for Employees in New York.—The directors of the Interborough Rapid Transit Company, New York, have appropriated \$50,000 to be used in the erection of club houses for the company's employees at six of the most important terminal points as follows: 159th Street and Eighth Avenue; 129th Street and Third Avenue; 179th Street yard; Third Avenue and Bronx Park; 242d Street and Broadway; 148th Street and Seventh Avenue. It is estimated that the club houses, which will be 65 ft. deep by 36 ft. wide, will cost \$8,000 each. They will contain shower baths, kitchens, smoking and reading rooms, and will be free to the men. The plans for the first of these houses have been filed with the building department of New York by George H. Pegram, chief engineer of the company. It is expected that four of the clubs will be completed and ready for use in the early fall. The other two will be completed as soon thereafter as possible. In addition to the amount voted by the directors of the company, August Belmont, chairman of the board, has donated his personal check for \$10,000, which will be used in supplying the clubs with books, magazines and newspapers.

Electrification of the New York Central & Hudson River Railroad.—In the expense budget of the New York Central & Hudson River Railroad for the year which ends June 30, 1910, there appears an item of \$8,477,682, for the electrification of suburban lines and for a New York terminal. A large portion of this money will be spent on the New York terminal; some of it will be used in adding extra tracks within the electric zone, but only a comparatively small part of it will be expended for electrification proper. One of the engineers of the New York Central & Hudson River Railroad, in outlining the plans of the company for the coming year, said that it is proposed to extend the electric zone on the Harlem division from Mount Vernon to North White Plains, a distance of about 10 miles. Curves and grade crossings will be eliminated, and the road will be put in first-class shape for express service. Substations are to be constructed at Tuckahoe and White Plains. They will be equipped with three 1000-kw rotary converters, similar in design to those which are now in service in the other substations of the company. In fact, the entire equipment will be installed according to the standards adopted by the New York Central & Hudson River Railroad. Circuit-breaker houses will be established about every 2 miles. The company contemplates making its Hudson division a four-track line all the way to Yonkers. At present there are four tracks to Spuyten Duyvil, but only two to Yonkers.

Electrification of Canadian Main Lines.—Hitherto the proposals to electrify main lines of railroad in Canada have been limited chiefly to the Western sections of the Dominion where large water-powers are abundant. U. S. Deputy Consul C. A. Steeves, at Moncton, now reports that the electrification of the Grand Trunk Pacific, or National Trans-continent Railway, from the St. Lawrence River

to Moncton, is now under the serious consideration of the railway company, the Dominion Government and the New Brunswick cabinet. Electrical engineers who have given the subject consideration declare the conditions to be entirely favorable. The distance between the St. Lawrence and Moncton is about 460 miles, and for a considerable part of the distance the road passes through dense forests of spruce and fir in lower Quebec and northern New Brunswick, as well as through the rich farming country along the upper St. John Valley. What has given impulse to the new plan is that at Grand Falls on the St. John River, 170 miles from the St. Lawrence and 160 miles from Moncton, is located water-power sufficient to develop energy enough for the working of the whole road. At this point the river has a natural fall of about 130 ft. and a flow that electrical experts estimate will be sufficient to furnish from 100,000 to 125,000 hp continuously by the utilization of comparatively inexpensive means of storage and conservation. As the requirements of the road are estimated at not more than 40,000 hp, there is every reason to believe that the supply will be more than equal to the needs.

Attorney-General of Maryland to Draw Utilities Bill.—The meeting of Governor Crothers' cabinet at Baltimore, Md., on Aug. 6, 1909, resulted in the selection of Attorney-General Straus to prepare a bill to create a public service commission in keeping with the ideas expressed publicly by the Governor. Governor Crothers, State Comptroller Hering, State Treasurer Vandiver, Secretary of State Williams, Attorney-General Straus and Adjutant-General Warfield were all present at the meeting. The Governor stated the purpose for which the meeting had been called and directed attention to the gas ordinance now pending in the City Council of Baltimore, which was, he said, in the nature of things, beyond the province of the cabinet. He said that he had received a copy of the ordinance, but that he presumed it had been sent to him as a matter of courtesy, as the original idea was to submit a proposition for contractual relations to which the State was to have been a party. Continuing on the question of public service legislation, the Governor is reported to have said: "Upon this subject of a public utilities commission, after much consideration, thought and study (not as much as I would like, but enough to make me sure of my ground), I have no hesitancy in declaring myself unreservedly in favor of such a commission. A public utilities commission in Maryland at this time is wise. I do not believe that it will accomplish everything that is expected of it. I do not believe, on the other hand, that it will hamper the success of the corporations nor drive from us others that might otherwise have come to us. Such a law as contemplated, if prepared with care, will do more to relieve agitation and excitement against corporations than any other single agency. It will prove a protection to corporations rather than a hindrance." The question of who should draw the bill received considerable attention. By some the opinion was expressed that the measure should be prepared by the Supreme Bench of Baltimore, but it was finally decided to entrust this work to Mr. Straus. The question of who should appoint the members of the commission was also discussed at considerable length. The opinion finally prevailed that the Governor should appoint the members.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Connecticut.—The Senate on Aug. 3 passed the utilities bill recommended by the majority of the special joint committee of the Legislature. This measure provides for a board of three members to have jurisdiction over the telephone, lighting and water companies, and leaves the control of the electric railways and railroads with the Railroad Commission. An effort was made to put through the substitute measure bringing the electric railways and the railroads within the province of the commission, but it was defeated by a vote of 16 to 15. On Aug. 5 the matter came before the House. After debating the subject from 10:45 a. m. until 4 p. m., with an hour excepted for luncheon, the House refused to amend the bill passed by the Senate by striking out all after the enacting clause and substituting for it the minority bill reported by Messrs. Chandler and Whiton, of the select committee on public utilities, by the close vote of 104 to 103. Before further action was taken the House adjourned and final action on the matter was thus postponed. Meantime honors rest with the supporters of the Barnum bill, which is the most conservative of all the public utilities commission measures which has been reported this session. The House on Aug. 10 refused by 117 votes to 113 to substitute an amended Whiton-Chandler bill for the Barnum bill on public utilities, and then indefinitely postponed the Barnum bill itself by an overwhelming viva voce vote. This in effect disposes in all probability of the whole public utilities subject for this session.

Financial and Corporate

New York Stock and Money Market

August 10, 1909.

The stock market paused for an instant to-day in its persistent upward climb. There were no serious losses, but the enthusiasm for buying which has marked the course of trading for the past few weeks was absent. Although it is admitted that prices are not justified by the trade conditions, confidence prevails that further advances are in sight. The traction shares have been fairly active and have, to a limited extent, shared in the general advance. Interborough-Metropolitan preferred, especially, has been a favorite with the traders.

The money market has finally indicated some disposition to tighten up. There is more demand upon the banks for loans, and rates in consequence are somewhat higher. Quotations to-day were: Call, 2 to 2½ per cent; 90 days, 3 to 3¼ per cent.

Other Markets

Rapid Transit has again been the leading traction feature in the Philadelphia market. Throughout the week it has been fairly active, but at the end quotations are practically unchanged. There has also been a fair amount of Union Traction in the market at unchanged prices.

In the Chicago market, there has been little doing in traction shares, although Subway continues to be active and higher. Large transactions in this issue have occurred and the price within the week has advanced from 19¾ to 24.

Massachusetts Electric has been the only traction issue in the Boston market that has had any sale, and even this has only come into sight in small lots. There have been no changes of any importance in the quotations.

In Baltimore, the remarkable activity of the bonds of the United Railways continues. Very large sales have been made although prices have remained practically unchanged. The stock has also been rather active, with a stronger tendency.

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

	Aug. 3.	Aug. 10.
American Railways Company.....	46	46
Aurora, Elgin & Chicago Railroad (common).....	41½	41½
Aurora, Elgin & Chicago Railroad (preferred).....	86½	86½
Boston Elevated Railway.....	127½	127½
Boston & Suburban Electric Companies.....	17½	17½
Boston & Suburban Electric Companies (preferred).....	71	70
Boston & Worcester Electric Companies (common).....	213	213
Boston & Worcester Electric Companies (preferred).....	55¼	54½
Brooklyn Rapid Transit Company.....	81¼	80¾
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	87½	87½
Capital Traction Company, Washington.....	2140¾	2142
Chicago City Railway.....	2195	2190
Chicago & Oak Park Elevated Railroad (common).....	2¼	3
Chicago & Oak Park Elevated Railroad (preferred).....	10	12
Chicago Railways, pteptg, ctf. 1.....	2119	2112
Chicago Railways, pteptg, ctf. 2.....	38	39
Chicago Railways, pteptg, ctf. 3.....	25	25
Chicago Railways, pteptg, ctf. 4s.....	210½	210
Cleveland Electric Railway.....	78	78
Consolidated Traction Company of New Jersey.....	76¾	78
Consolidated Traction of N. J., 5 per cent bonds.....	2106½	2106½
Detroit United Railway.....	270	270
General Electric Company.....	172	171¾
Georgia Railway & Electric Company (common).....	92¼	94
Georgia Railway & Electric Company (preferred).....	288	288
Interborough-Metropolitan Company (common).....	15¾	15½
Interborough-Metropolitan Company (preferred).....	49¾	48¾
Interborough-Metropolitan Company (1½s).....	83½	83¼
Kansas City Railway & Light Company (common).....	218	218
Kansas City Railway & Light Company (preferred).....	84	83¾
Manhattan Railway.....	144¾	144½
Massachusetts Electric Companies (common).....	212¾	127
Massachusetts Electric Companies (preferred).....	275	273½
Metropolitan West Side, Chicago (common).....	218	15¾
Metropolitan West Side, Chicago (preferred).....	2148½	2148½
Metropolitan Street Railway.....	24	23
Milwaukee Electric Railway & Light (preferred).....	2110	2110
North American Company.....	85	85
Northwestern Elevated Railroad (common).....	222	221
Northwestern Elevated Railroad (preferred).....	271	270
Philadelphia Company, Pittsburg (common).....	42½	44
Philadelphia Company, Pittsburg (preferred).....	42½	44½
Philadelphia Rapid Transit Company.....	32	31
Philadelphia Traction Company.....	201	201¼
Public Service Corporation, 5 per cent col. notes.....	2100¼	2100¼
Public Service Corporation, cfs.....	201	202½
Seattle Electric Company (common).....	2105	2112½
Seattle Electric Company (preferred).....	105	105
South Side Elevated Railroad, Chicago.....	258	258
Toledo Railways & Light Company.....	209¼	210½
Third Avenue Railroad, New York.....	204	204
Twin City Rapid Transit, Minneapolis (common).....	2103¾	2103¾
Union Traction Company, Philadelphia.....	55¾	55¼
United Railways & Electric Company, Baltimore.....	213¾	14
United Railways & Electric Company, San Francisco (common).....	2138½	2138½
United Railways Inv. Co., San Francisco (preferred).....	56	54
United Railways Inv. Co., San Francisco (common).....	2147	2147
Washington Railway & Electric Company (preferred).....	203	202½
Washington Railway & Electric Company (common).....	205	206½
West End Street Railway, Boston (common).....	106	105
West End Street Railway, Boston (preferred).....	86¼	88
Westinghouse Electric & Manufacturing Company.....	2130	2120
Westinghouse Elec. & Mfg. Company (1st pref.).....	2130	2120

aAsked. *Last sale.

Reorganization Plan of Ocean Shore Railway

The reorganization committee of the Ocean Shore Railway, San Francisco, Cal., consisting of Homer S. King, Henry P. Scott, J. D. Grant and Charles Dutton, has made public the proposed plan of reorganization of the Ocean Shore Railway. It calls for the deposit of bonds of the company with the Mercantile Trust Company, San Francisco, Cal., as depository.

The Ocean Shore Railway was incorporated in May, 1905, to build an electric railway from San Francisco to Santa Cruz. It was capitalized at \$5,000,000, and had an authorized bond issue of \$5,000,000, secured by a mortgage dated Nov. 1, 1905, and due Nov. 1, 1935. Of these bonds, \$1,300,000 was sold during 1905 and 1906 and work was begun on the company's line. The San Francisco disaster affected conditions adversely on the Coast, however, and the company was unable to sell any more of its bonds for some time. Within the last two years it has sold \$1,700,000 additional bonds, making the total amount of bonds outstanding about \$3,000,000 with the remaining \$2,000,000 used as collateral for temporary loans. The present stockholders of the company have paid in cash \$2,250,000, which has been invested in property. This property consists of 38 miles of line completed south of San Francisco, and 14 miles of line north of Santa Cruz, there being an intermediate distance of 26½ miles yet to be completed to connect San Francisco and Santa Cruz. The company has secured valuable terminal facilities in San Francisco and has valuable terminal sites under contract in Santa Cruz. J. G. White & Company, Inc., who reported on the condition and prospects of the company, say that the grading and track can be completed for approximately \$850,000, and estimate that the net earnings of the company after allowing for operation and maintenance for the first year of complete operation will be not less than \$250,000, and that the country tributary to the road is of such character as to insure a steady increase in earnings.

The plan of reorganization calls for the incorporation of the San Francisco & Ocean Shore Railroad or a company with a similar name to be capitalized at \$15,000,000. Of this, \$7,500,000 will be common stock and \$7,500,000 will be 5 per cent non-cumulative preferred stock. It is also proposed to issue \$3,500,000 of first mortgage 30-year gold bonds and \$15,000,000 of consolidated mortgage 5 per cent sinking fund bonds. Of this \$15,000,000, \$3,500,000 will be reserved to retire the new first mortgage bonds, \$5,000,000 will be exchanged for present bonds of the Ocean Shore Railway dollar for dollar, and \$6,500,000 will be reserved in the hands of trustees for future extensions and improvements. Provided all of the Ocean Shore Railway's first mortgage bonds are deposited with the depository in exchange for San Francisco & Ocean Shore Railroad consolidated mortgage bonds, the San Francisco & Ocean Shore Railroad will purchase from the Ocean Shore Railway all its property, assets, franchises, real estate, etc., and will execute a first mortgage to the Union Trust Company as trustees to secure \$3,500,000 of first mortgage bonds. The consolidated mortgage bonds will be a lien on all the property of the company, subject to the \$3,500,000 of first mortgage bonds and as an equivalent number of consolidated bonds are reserved to retire the first mortgage bonds at such time as it can be done advantageously, the consolidated mortgage bonds will eventually become a first mortgage on the property. If this plan is carried out the company will have in its treasury \$3,500,000 of first mortgage bonds, which it will be able to sell or use as collateral for temporary loans. This will be sufficient to enable the company to procure immediately funds to pay off the real estate mortgages on its present terminals and complete the road from San Francisco to Santa Cruz and put it in first-class shape for operation.

Beaumont (Tex.) Traction Company.—The United States Circuit Court at Sherman, Tex., on the application of the Interstate Trust & Banking Company, New Orleans, La., the mortgage trustee, has appointed James F. Weed, Beaumont, receiver of the Beaumont Traction Company, in order to protect the bondholders, the city having threatened a suit to forfeit the company's charter.

Boston & Northern Street Railway, Boston, Mass.—The Massachusetts Railroad Commission has approved the issue by the Boston & Northern Street Railway, at the price of \$115 per share as fixed by its stockholders, of not exceeding 5883 shares of 6 per cent cumulative preferred stock.

Buffalo, Lockport & Rochester Railway, Buffalo, N. Y.—Judge Hazel in the United States Equity Court at Buffalo on Aug. 5, 1909, appointed John M. Campbell, Rochester, and Milford W. Childs, Medina, receivers of the Buffalo, Lockport & Rochester Railway. The application for the receivership was made by the National Bond & Share Company, Ltd., Toronto, Ont., which is a creditor of the Buffalo,

Lockport & Rochester Railway for about \$28,000 and owns 2340 shares of the stock of the company.

Columbus, Delaware & Marion Railway, Columbus, Ohio.—Judge Baston G. Young, in the Court of Common Pleas of Franklin County, Ohio, at Marion, has appointed George Ehysall, general manager of the Columbus, Delaware & Marion Railway, receiver of the company on a petition filed by N. J. Catrow, treasurer of the company and president of the First National Bank, Miamisburg. Mr. Cartow is holder of a collateral note for \$372,381, dated June 1, 1907, and due Sept. 1, 1907, and he asserts that since June 1, 1907, part of the interest on the \$2,500,000 mortgage bonds has been paid from capital and not from earnings, and that \$23,000 bond interest due Aug. 1, 1909, has not been paid.

Inter-State Railways, Philadelphia, Pa.—Owing to the delay in the acceptance of the reorganization plan, the Inter-State Railways on Aug. 1, 1909, notified the Philadelphia Stock Exchange that interest coupons of the 4 per cent bonds due Aug. 1, 1909, would not be paid on that date, and that the exchange would be informed of any arrangements made for payment of said coupons. John C. Bell, attorney of the Carson Estate, has received permission from Judge Solly, of the Orphans' Court, at Montgomery County, Pa., to deposit the bonds of that estate, amounting, it is said, to \$4,000,000, under the terms of the Earle plan. The following unofficial statement was made recently regarding the progress of the reorganization plan: "There have already been deposited about \$750,000 bonds under the plan. The directors own and control approximately \$2,000,000 additional bonds, so that the total of \$6,750,000 is now assured. The directors had agreed to deposit their bonds at the same time the Carson bonds are deposited, and that is the reason why they were not put in before this. With \$6,750,000 secured, it should not be difficult to get in the additional \$750,000 to make a total of \$7,500,000, or 75 per cent of the outstanding issue, which the Earle committee desires before declaring the plan operative."

Jacksonville (Fla.) Electric Company.—The stockholders of the Jacksonville Electric Company will meet on Aug. 16, 1909, to vote to increase the capital stock of the company from \$1,100,000 to \$1,500,000.

Metropolitan Crosstown Railway, New York, N. Y.—The bondholders' protective committee of the Metropolitan Crosstown Railway, J. Augustus Barnard, chairman, announces that the time for deposits of first mortgage 5 per cent bonds with the Columbia Trust Company, New York, has been extended until Oct. 15, 1909.

Old Colony Street Railway, Boston, Mass.—The Massachusetts Railroad Commission has approved the issue by the Old Colony Street Railway, at the price of \$115 per share, as fixed by its stockholders, of not exceeding 4042 shares of 6 per cent cumulative preferred stock.

Philadelphia, Bristol & Trenton Street Railway, Philadelphia, Pa.—At the sale of the Philadelphia, Bristol & Trenton Street Railway under foreclosure of the first mortgage at Doylestown, Pa., recently, the bidding started at \$200,000, the upset price, and the property was finally purchased for \$380,000 by Carl N. Martin, Philadelphia, Pa., and John Redmond, Baltimore, Md., representing the bondholders' committee, which holds \$627,000 of the issue of \$650,000 bonds. The plan of reorganization is not yet ready for publication. Mr. Martin is a member of the firm of R. T. Martin & Company, 302 Stock Exchange Building, Philadelphia, Pa., and is secretary of the bondholders' committee of the Philadelphia, Bristol & Trenton Street Railway.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa.—The Pittsburgh, McKeesport & Westmoreland Railway has purchased about the last block of bonds of the Pittsburgh & Westmoreland Railway, and now owns about 90 per cent of the stock and bonds of that company. The receivers of the Pittsburgh & Westmoreland Railway are preparing an application for permission to sell the property of the company to the Pittsburgh, McKeesport & Westmoreland Railway, free and clear of all liabilities.

Public Service Corporation, Newark, N. J.—To take up \$7,250,000 of collateral trust notes due on Nov. 1, 1909, and approximately \$500,000 of outstanding convertible gold notes, the Public Service Corporation of New Jersey has sold to J. P. Morgan & Company, New York, N. Y., and Drexel & Company, Philadelphia, Pa., \$8,000,000 of its first mortgage 5 per cent bonds of 1908, authorized for \$50,000,000.

Worcester (Mass.) Consolidated Street Railway.—The Massachusetts Railroad Commission has approved the petition of the Worcester Consolidated State Railway for an issue of mortgage bonds to an amount not exceeding, at par, \$3,182,000, payable 20 years from date thereof, with interest at a rate not exceeding 5 per cent.

Traffic and Transportation

Prospects for Amicable Settlement of Labor Differences in Chicago

What was considered to be one of the critical points in the wage dispute between the railway companies of Chicago and their employees was quietly passed the latter part of the week which ended on Aug. 7. A referendum vote was taken on Aug. 3 by the employees of the Chicago Railways Company, Chicago City Railway Company and the Calumet & South Chicago Railway Company, and it was announced that the men were almost unanimous in favor of declaring a strike unless the demands made to the companies were met. The State board of arbitration, the Mayor of Chicago and many of the leading business men of the city worked to bring about an amicable settlement. Representatives of the employees conferred several times during the week with Thomas E. Mitten, president of the Chicago City Railway, and John M. Roach, president of the Chicago Railways, and it was announced that negotiations were under way for a peaceful settlement. After one of these conferences Mr. Mitten presented a proposition to the wage scale committee of the Calumet & South Chicago Railway, which is operated by the Chicago City Railway, whereby the 268 employees of that line are to be granted an increase in wages. The agreement, in the event of acceptance by the men, will date back to June 1, 1909, when the contract between the company and its employees expired.

The scale of wages called for in the suggested plan was as follows: For the next nine months of service, 24 cents per hour; after nine months, 26 cents per hour. The following scale of wages was suggested to begin May 1, 1910: First three months, 22 cents; next six months, 24 cents; after nine months, 26½ cents. It was announced from President Mitten's office that any increase in salary that may be granted to the employees of the Chicago City Railway will apply proportionately to the employees of the Calumet & South Chicago line.

At the first conference of the week between Mr. Mitten and the Chicago City Railway employees, it was stated that no definite propositions had been presented by either side, but that the subjects of wages, cost of living, possibility of arbitration and other subjects pertaining to the labor troubles, were discussed by Mr. Mitten and the men in a general way.

On Aug. 7 the Chicago City Railway issued a statement which set forth its side of the controversy. This statement is given below.

"The management of the Chicago City Railway desires that all interested be fully informed as to the actual facts concerned in the present wage controversy.

"The total revenue of the company from the operation of the street railway represents the following annual return upon the value of the property as certified by the Board of Supervising Engineers and accepted by the city:

	1907.	1908.	1909.
Value of property.....	\$28,168,980	\$36,170,482	\$38,630,418
Annual income	1,634,976	2,194,276	2,261,421
Annual return.....	6.33 per ct	5.60 per ct.	5.85 per ct.
Average annual return for the 3 years, 5.93 per cent.			

"While it is true that during the rehabilitation period, now closing, the company, in the position as broker and contractor, receives an allowance of 15 per cent upon the funds used in the rehabilitation, this cannot be considered as an earning of the property in which the men should participate, nor will it continue to any great extent in future, due to the completion of the rehabilitation work.

"During the negotiations prior to the passage of the settlement ordinances the representatives of the union appeared before the transportation committee and presented their demands for a rate of 33 cents an hour. A committee consisting of Professor Cooley, B. J. Arnold and Mr. Du Pont investigated the reasonableness of this demand at the request of the transportation committee, and their report of Dec. 22, 1906, was to the effect that the payment of this wage would bankrupt the company, their further statement being that a possible improvement in wage conditions lie in the direction of increased speed of cars to be secured by the co-operation of the men and rehabilitation of the property.

"In December, 1906, when urging the co-operation of the men in effecting a settlement with the city President Mitten made the statement that the then speed of the cars averaged 8.3 miles an hour for the system, the then scale of wages being 19 cents an hour for the first six months, 24 cents for the next six months, and 25 cents thereafter, with an average wage of 24 cents an hour; that this, by the co-operation of the men and rehabilitation of the system could

be increased to 9.03 miles an hour, which would enable the company to pay a scale of wages as follows: 25 cents first year, 26 cents second year, 27 cents third year, 28 cents fourth year, 29 cents fifth year, 30 cents sixth year, making an average wage of 26.20 cents an hour.

"After the passage of the ordinance and its ratification at the polls the company advanced the wages of the men to the now existing scale of 23 cents first three months, 25 cents next nine months, and 27 cents thereafter, paying an average wage of 26.20 cents an hour.

"The speed of the cars in May, 1909, reached an average of 8.8 miles an hour. The natural increase in the average wage of the men due to their increased age in service and without any change in the scale now produces an average of 26.68 cents an hour, which approximates proportionately the advance now due to the men on the theory of increased speed attained.

"The company, in order to secure the co-operation of the men, thus discounted the future and increased the wages two years ago proportionate to that which is only now justified by the speed obtained. This action should, in the opinion of the company, be given consideration in the event of arbitration.

"The company is desirous of having the wage question settled in such a way as to prevent its being brought up annually, for the reason that any question which serves to agitate the minds of the men is productive of accidents, and is generally detrimental to the service and discipline of the company.

"The company recognizes that there may be fair differences of opinion as to the merits of the case, and, as it is the policy of the company to treat its men in fairness at all times, there should be no question of a strike or any disturbance which would result in the interruption of the service or the discommoding of the public. The contract with the men expiring Aug. 1, the conditions of which the company is still fulfilling, provides a method of arbitration for the settlement of all disputes, the company being willing to abide by the decision of arbitration so selected under this agreement as final and binding in the settlement of this dispute."

John M. Roach, president of the Chicago Railways, met committees on Monday, Aug. 9, and made conciliatory offers from which it is expected a satisfactory adjustment of the entire wage question with his employees will develop. The proposition presented provides for the following wage scale: First year, 22 cents per hour; after one year, 25 cents per hour; after third year, 27 cents per hour; after five years, 28 cents per hour; after 10 years, 29 cents per hour, and after 15 years, 30 cents per hour. Mr. Roach stated that he believes the older men in the service should be the ones to receive the maximum salary. He also stated that under this arrangement practically 65 per cent of the employees of the Chicago Railways would receive an immediate increase in salary. During the day President Mitten, of the Chicago City Railway, also submitted to his employees a schedule similar to that presented by Mr. Roach. The following shows the scale of wages as now paid to the employees of the Chicago Railways and the wages demanded by them: First six months, present scale 23 cents; demand, 25 cents. After six months, present scale 25 cents; demand, 28 cents. After one year, present scale 27 cents; demand, 30 cents.

The present wage scale and demand of the employees of Chicago City Railway follows: First six months, present scale 23 cents; demand, 24 cents. After six months, present scale 25 cents; demand, 27 cents. After one year, present scale 27 cents; demand, 30 cents.

Conferences were held daily during the week between the officers of the Chicago Railways and the Chicago City Railway and the committees named by the employees to negotiate with them. It is generally conceded that the efforts that have been made to conciliate the men will result in an amicable settlement of the differences between the companies and their employees.

Transfer Charge Sustained on Newton System

The Massachusetts Railroad Commission has issued an order dated Aug. 4, 1909, in which the continuance of withdrawal of free transfers for another year upon the Newton lines of the Middlesex & Boston Street Railway is approved. On July 23, 1909, the company petitioned the commission to extend the time in which 1 cent may be charged for each transfer issued, stating that the earnings of the company do not warrant the restoration of free transfers upon the lines formerly operated by the Newton Street Railway and recently taken over by the Middlesex & Boston Street Railway.

A hearing was given by the commission on Aug. 3, 1909, and no one was present to oppose the petition. M. C.

Brush, vice-president and general manager, represented the company. He stated that, in order to secure, with least burden upon the public, a proper and just return upon capital actually invested, it is necessary to continue to make the charge of 1 cent for each transfer, as during the past year. He submitted figures showing that the gross passenger receipts of the Newton lines from September, 1908, to June, 1909, inclusive, were only seven-tenths of 1 per cent greater than the same period with free transfers a year before, being \$287,799.93 this year, against \$285,688.72 last year; the number of passengers carried was 6,284,241 in 1909, against 6,434,602 in 1908; the number of transfers issued was 549,159 this year, against 733,733 last year, when transfers were free; and the number of transfers received was 531,125 in 1909, against 623,556 in 1908. In other words, 96.5 per cent of the transfers issued were turned in when the extra cent was imposed and 85 per cent were turned in when the transfers were free. The number of unredeemed transfers decreased from 15 per cent to 3.5 per cent by charging for transfers, while the total number of transfers issued decreased 25 per cent and the total number of passengers carried decreased about 2.3 per cent.

The following figures were presented, showing the gross passenger receipts of the Newton lines, the number of passengers carried, and the number of transfers issued and received by lines for the 10 months ending June 30, 1909, and the same period of 1908:

GROSS PASSENGER RECEIPTS.			
1908-9, Transfer Charge 1 Ct.		1907-8, Free Transfers.	
September	\$34,262.95	September	\$33,277.87
October	29,576.95	October	28,632.07
November	26,522.22	November	26,781.86
December	26,023.61	December	25,235.50
January	24,139.55	January	23,819.66
February	22,750.53	February	22,497.73
March	24,545.00	March	24,433.88
April	26,426.12	April	26,007.07
May	32,887.62	May	32,516.11
June	40,663.38	June	42,486.97
Total	\$287,799.93	Total	\$285,688.72

NUMBER PASSENGERS CARRIED.			
1908-9, Transfer Charge 1 Ct.		1907-8, Free Transfers.	
September	749,402	September	750,001
October	644,382	October	649,828
November	577,448	November	607,122
December	565,811	December	569,603
January	528,744	January	539,431
February	497,148	February	508,227
March	537,120	March	552,253
April	575,303	April	579,607
May	718,698	May	728,993
June	890,185	June	949,447
Total	6,284,241	Total	6,434,602

TRANSFERS ISSUED AND RECEIVED.			
1908-9, Trans- fer Charge 1 Ct. Issued, Received.		1907-8, Free Transfers. Issued, Received.	
September	63,484 61,266	September	84,615 72,461
October	58,076 55,341	October	80,236 66,497
November	51,501 48,733	November	73,324 61,709
December	49,804 47,870	December	66,713 56,801
January	47,532 46,154	January	62,237 52,975
February	44,247 42,784	February	54,813 48,638
March	48,324 46,212	March	62,587 53,712
April	52,735 49,996	April	64,309 53,458
May	61,866 59,848	May	84,541 69,846
June	71,590 72,921	June	100,358 87,459
Total	549,159 531,125	Total	733,733 623,556

During the period from Sept. 1, 1908, to July 1, 1909, the Newton lines received \$5,491.59 on account of transfers issued at 1 cent each, and paid foreign roads (the Lexington & Boston Street Railway and the Newton & Boston Street Railway) \$1,093.53, at one-half cent additional, per transfer, making the net gain to the Newton lines on account of the additional charge, \$4,398.06.

The earnings of the consolidated Middlesex & Boston system for July, 1909, are \$59,427.13, compared with \$57,783.19 for the component lines in July, 1908, the free transfer being in effect at the latter-named period. The passenger traffic of the consolidated lines for July, 1909, was 1,217,850, against 1,206,392 in July, 1908. The transfers issued on the Newton lines in July, 1909, were 60,706, against 93,077 in July, 1908. During July, 1909, the Newton lines paid \$573.41 to the connecting roads above named, on transfer accounts.

The decision of the commission follows: "On July 31, 1908, the board made a decision upon the petition of the Newton Street Railway, as follows:

"We have therefore determined to approve a withdrawal of free transfers on the Newton Street Railway for a limited period as an experimental measure, being of the opinion that at the end of this period, or prior thereto if

conditions should warrant, and unless unexpected loss of business necessitates the further extension of time, the company would restore the free transfers. We take this course that the company, rather than the public, may carry the burden of bringing this matter formally before us in the event of an occasion arising for such action. * * *

"It is therefore ordered that the petition of the Newton Street Railway be granted for an experimental period of one year from the date hereof."

"The petitioner requests the board to approve the withdrawal of free transfers beyond the period limited in said order and alleges that the earnings of the Middlesex & Boston Street Railway, which has succeeded to the property and franchises of the Newton Street Railway by consolidation, do not warrant the restoration of free transfers upon lines formerly operated by the Newton Street Railway as required by said order.

"After a careful examination of the statement of receipts of the Newton Street Railway prior to consolidation and of the Middlesex & Boston Street Railway for July, 1909, we are of opinion that we ought to approve the withdrawal of free transfers for a further period. We deem it in the public interest, however, that the period should be a limited one, in view of the consolidation of the companies, and therefore order that the petition of the Middlesex & Boston Street Railway be granted for an experimental period of one year from the date hereof."

Evansville Strike Ended

After being locked out for 69 days the striking employees of the Evansville & Southern Indiana Traction Company, Evansville, Ind., have given up their fight and thrown themselves on the mercy of the company. Each time any new proposal of settlement or arbitration was made to the company, it replied that the first move looking toward any settlement must be made by the strikers declaring the strike off and lifting the boycott. This they did. The company will now take back some of the men who were previously loyal and efficient. The majority of the men, however, will never be re-employed, as the company has re-established its service with permanent employees whom it will prefer in all cases. Any of the strikers re-employed will be considered as new men and compelled to take their place on the extra list. The fight was a very bitter one. Organized labor is well entrenched in Evansville, and the boycott was maintained until the last. Considerable violence occurred from time to time, including an assault on one of the conductors in which a man was killed, and the dynamiting of four or five cars. The situation is now greatly improved, and the opinion is expressed that conditions in Evansville are likely to be much better in the future than they have been in the past.

Freight Rights Granted in Memphis.—The Memphis (Tenn.) Street Railway has been granted the privilege of carrying freight on four lines in Memphis, two in New South Memphis and one to Buntyn and Raleigh, in accordance with the recommendation of the railroad committee of the City Council.

Western Ohio Railway Readjusts Passenger Rates.—Local passenger tariffs on the Western Ohio Railway, Lima, Ohio, have been readjusted according to a recent ruling of the Railroad Commission, with the result that commutation tickets have been withdrawn and the coupon books which have been sold for \$7.50 will hereafter be sold for \$8.75. While there are several reductions, the new rates show a general advance.

Booklet of the Historic Mt. Vernon Line.—Richard W. King, general manager of the Washington, Alexandria & Mt. Vernon Railway, Washington, D. C., has issued a booklet containing scenes along that line which is divided into four parts. In Part 1, scenes along the route to Mt. Vernon are shown. In Part 2, views of the Arlington National Cemetery are shown. In Part 3, views at Ft. Myer, Va., are shown. In Part 4, views along the Falls Church division en route to historic Fairfax are shown.

Summer Dress in New Haven.—The Connecticut Company recently posted in its barns at New Haven the following order regarding the dress of its trainmen during the summer months: "Uniform coats must always be kept buttoned when on duty, except from May 15 to Oct. 1, when they may be worn unbuttoned, provided a uniform vest is worn and the vest kept buttoned. If a uniform vest is not worn during this period, coats must be kept buttoned. Conductors and motormen must wear white collars and neckties; negligee shirts with soft collars do not make a very presentable appearance."

Camera Sketches of Sacandaga Park.—The Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., has is-

sued a very beautiful booklet of camera sketches for Sacandaga Park and the territory along the company's lines so that the summer tourist may appreciate the attractions better. The publication is 12 in. long by 9 in. wide, and contains 80 pages of heavy coated paper, all of which are given over to half-tone illustrations. Some of the illustrations are grouped, but many of them occupy a page each. There are only 50 words of text and these concern the purpose of the publication and the facilities of the passenger department of the company for answering inquiries. A brown-black ink has been used with excellent results, the illustrations being free from the garish effect of a light ink and the somber effect of solid black ink.

Action to Revoke Franchise of the Indiana Union Traction Company.—On complaint of patrons of the Indiana Union Traction Company, Anderson, Ind., the Commissioners of Cass County, Ind., have summoned the officials of the company to appear before them on Sept. 7, 1909, and show cause why the franchise of the company should not be revoked. The complainants asked that the commissioners compel the company to restore the fares formerly in use under penalty of forfeiture of its franchise, which it is claimed provides for a maximum charge of only 1½ cents per mile in Cass County. The complainants allege discrimination and violation of the provision of the franchise and cite the following: The distance between Galveston to Kokomo is 7 miles and the fare is only 10 cents. The distance between Galveston and Walton is only 6 miles and the fare is 15 cents. The distance from Walton to Logansport is 10 miles and the fare is 20 cents.

"Trolley Trips in Central New York."—This is the title of a folder issued by the Auburn & Syracuse Electric Railroad, Auburn & Northern Electric Railroad, Rochester, Syracuse & Eastern Railroad, Newark & Marion Railway, Syracuse; Lake Shore & Northern Railroad and the Syracuse & South Bay Electric Railroad, through J. Stanley Moore, general passenger agent. Each road is described separately, the idea being to furnish a short description of the roads, and the territory through which they operate and to give some facts concerning points of general interest along the several routes. The publication is printed in colors on cream-tinted blocks. There is also a double-page map of the different lines including the territory between Syracuse on the East and Rochester on the West and Canandaigua Lake, Seneca Lake, Cayuga Lake, Owasso Lake and Skaneateles Lake on the south and Lake Ontario on the north. The cover is printed in colors.

By Trolley in Rochester and Vicinity.—The New York State Railways, Rochester Lines, through B. E. Wilson, general passenger and express agent, has issued a folder descriptive of the lines of the New York State Railways in and about Rochester. The descriptions of places of interest are brief, but the circular is replete with pictures that tell the story of the attractions of the territory served by the company better than could even a master of the art of description with his pen. The principal places of interest in Rochester are tabulated for ready reference, and complete instructions are given regarding fares and accommodations on both the city and the interurban lines. A particularly interesting feature of the publication is a map showing the electric railway lines in and about Rochester. In one corner of this map are tabulated and numbered the depots, buildings, hotels, cemeteries, hospitals and theaters, the map being made to correspond, thus establishing the location of the principal points of interest.

Washington, Baltimore & Annapolis Railway Advertises Excursions.—The Washington, Baltimore & Annapolis Electric Railway advertised in the daily papers four special excursions for Sunday, Aug. 8, and Monday, Aug. 9. They included excursions on Aug. 8 to Gettysburg, Tolchester Beach and St. Michaels, Md., on the Eastern Shore, and on Aug. 9 to Ocean City, Md. There was also an excursion to Annapolis and West River, including a steamer ride on Chesapeake Bay. The excursion to Gettysburg was by special train on Aug. 8, leaving the White House station, Fifteenth and H Streets, Northeast Washington, at 6:55 a. m., returning same evening, and allowing six hours to view points of interest on the famous battlefield. Special trains also left from the White House station for Annapolis at 11 a. m. for steamers for Tolchester Beach and St. Michaels. Both these trips include steamer rides across Chesapeake Bay at one of its widest points. On Aug. 9 an unusual one-day excursion to the seashore was operated. A special train left White House station at 6:50 a. m. for Annapolis, where a steamer transferred the passengers across the bay to Claiborne. At Claiborne a special through train was taken to Ocean City, arriving at that point at 12:30 noon. The return trip was made at 6:45 p. m. from Claiborne.

Personal Mention

Mr. Adrian H. Joline, receiver with Mr. Douglas Robinson of the Metropolitan Street Railway, New York, N. Y., has sailed for Europe, to be gone until Oct. 1. In his absence Mr. William H. Coleman, assistant to the general counsel of the Metropolitan Street Railway, will take Mr. Joline's place, by order of Judge Lacombe of the United States Circuit Court.

Mr. Charles Macloskie, Brussels, Belgium, who has been spending a short vacation in New York State, sailed for home on Aug. 5. Mr. Macloskie is one of the well-known men of the industry, having been identified with the Bentley-Knight Company, the Thomson-Houston Company and the Allgemeine Electricitäts Gesellschaft. He was one of the engineers of the intra-mural road at the Chicago World's Fair.

Mr. J. W. Glendenning, who has been elected treasurer of the Saginaw Valley Traction Company, Saginaw, Mich., was connected with the Camden (N. J.) Suburban Railway from 1899 to 1904, and was assistant secretary of the company when the property was leased to the Public Service Corporation in 1904. From May, 1904, until April, 1907, he acted as assistant railway auditor of the South Jersey division of the Public Service Corporation. Since 1907 Mr. Glendenning has been clerk to the general manager of the Bay City Gas Company, Saginaw Valley Traction Company, Bay City Traction & Electric Company, Bartlett Illuminating Company and the Saginaw City Gas Company, and since June, 1908, has also filled the position of general passenger and freight agent of the company.

Mr. Oscar L. Young, Laconia, N. H., has been appointed a member of the Railroad Commission of New Hampshire to succeed Henry M. Putney, deceased. Mr. Young was born at Ossipee, N. H., on Sept. 11, 1874. He was educated in the public schools of Ossipee and Effingham and at Brewster Free Academy, from which he was graduated in 1895. Mr. Young then entered the law office of Judge S. W. Adams, where he studied law for two years. In 1898 he entered the Boston University Law School and was graduated in June, 1900, with the degree of LL.B. In March, 1900, Mr. Young was admitted to the bar, and in 1901 became associated with Mr. Edwin H. Shannon in the practice of law at Laconia and continued to be associated with Mr. Shannon until 1903, when he opened an office for himself. He was appointed judge of the Laconia Police Court in September, 1903.

Mr. Arthur G. Whittemore, who has been a member of the Railroad Commission of New Hampshire, has been appointed chairman of that body. Mr. Whittemore was born in Pembroke, N. H., on July 26, 1858, and was educated at Pembroke Academy and the Harvard Law School and was admitted to the bar in March, 1879. Soon after he became associated with C. W. Woodman, Dover, in the practice of law, the partnership continuing until the death of Mr. Woodman in 1888. Since that time Mr. Whittemore has practised alone. In 1885 he was appointed receiver of the Dover National Bank and later assisted in reorganizing the First National Bank, Somersworth. In 1887 the city of Dover built a new water works and Mr. Whittemore was elected water commissioner. Later, he was elected Mayor of Dover, a position which he held for three successive terms. In May, 1903, he was appointed a member of the railroad commission to succeed the late Francis C. Faulkner, Keene, and has served on the board continuously since that time. Mr. Whittemore succeeds Mr. Putney as chairman of the commission, Mr. Putney's place on the commission being taken by Mr. Young, as mentioned above.

The electric railway up Mont Blanc was started on Sunday, July 25, and the first section is open to the public, which is now able to ascend to the Col de Voza, 5495 ft. high. The first train up took an hour to accomplish the journey of about 4½ miles. There are no tunnels, and the steepest grade is 20 ft. in the 100. Some magnificent views of Alpine scenery can be had from the cars. Having accomplished the first stage of the journey up Mont Blanc, the plan is to continue along the ridge of the Col de Voza, tunneling through first the Aiguille and then the Dôme du Gôûter, coming out by the Observatoire Vallot. From there a tunnel will have to be made right underneath the Bosses du Dromadaire, into the heart of Mont Blanc, and then the summit is to be reached, as in the case of the Jungfrau, by means of a lift. This is the plan for the continuation of the line, and it has even been calculated that the cost of the return ticket is to be \$20.

Construction News

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

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

RECENT INCORPORATIONS

***Ohio Valley Traction Company, Brookport, Ill.**—Incorporated to build an electric railway from a point at or near Golconda via Brookport to Joppa, Ill. Headquarters, Brookport. Capital stock, \$10,000. Incorporators: O. H. Margrave, G. W. Tucker, William Pell, H. W. Holfield and William D. Harrington, Brookport; Chenault Webb and Robert C. Leeper, Unionville and C. L. Robertson, Paducah, Ky.

Jackson Interurban Railroad, Light & Power Company, Jackson, Miss.—Incorporated to build an electric railway from Jackson to Clinton, a distance of 10 miles. The company also proposes to operate gas and electric light and power plants. Capital stock, \$100,000. Incorporators: R. E. Kennington, W. J. Davis, W. H. Watkins, Jake Ehrman, H. L. Hicks, H. R. Henry, P. B. Bridges, W. M. Anderson, A. C. Jones, Jackson; J. W. Provine and D. N. McLean, Clinton. [E. R. J., July 31, '09.]

***Enid (Okla.) Central Traction Company.**—Incorporated to build an electric interurban railway to connect Guthrie, Enid, Lawton, Chickasha, El Reno, Kingfisher, Cherokee, Pond Creek, Medford and Blackwell, 70 miles distant. The company expects to begin construction by Sept. 1. Headquarters, Enid. Capital stock, \$1,000,000. Incorporators: W. H. Stewart, R. W. Whittinghill and C. E. Burkhardt, Enid; M. F. McMahon and J. W. Smith, Toledo, Ohio.

***Farmers' Railway & Navigation Company, Pendleton, Ore.**—Incorporated in Oregon to construct a railroad with electricity, gasoline or steam as motive power to connect Umatilla, Holdman, Helix, Hermiston, Echo and Pendleton. Headquarters, Pendleton, Ore. Capital stock, authorized, \$250,000; issued, \$125,000. Officers: Chas. A. Hill, Pendleton, president; A. A. Cole, Pendleton, secretary, treasurer and purchasing agent; E. T. Erickson, Hermiston, chief engineer.

Johnstown & Gallitzin Railway, Johnstown, Pa.—Chartered to construct an electric railway to connect Johnstown, Dale, Walnut Grove, Geistown, Elkton, Salix, Lovett, St. Michaels, South Fork, Summerhill, Wilmore, Portage, Lilly and Gallitzin, a distance of 32 miles. Capital stock, authorized, \$200,000; issued, \$70,000. Headquarters, Suppes Building, Johnstown. Officers: Wallace Sherbine, president; Alian Sherbine, secretary; H. W. Storey, treasurer; G. U. G. Holman, general manager and electrical engineer. [E. R. J., June 12, '09.]

***Cook Creek Electric Light & Railway Company, Clinton, Tenn.**—This company has been granted a charter to build an electric railway in Anderson County. Capital stock, \$25,000. Incorporators: Chas. Loyd, J. P. Stanton, E. M. Beasley, J. S. Stanton and S. B. Faris.

***Kanawha & Ohio Valley Traction Company, Charleston, W. Va.**—Incorporated to build an electric railway from Kanawha Falls on the north side of the Kanawha River to Point Pleasant. The company is having surveys made between Charleston and Kanawha Falls. Incorporators: Geo. S. Couch, F. P. Crosscup and others, of Charleston.

***Superior (Wis.) Traction Company.**—Incorporated to operate an electric railway system in Superior. Capital stock, \$100,000. Incorporators: Richard Russell, P. J. Eckstand and S. L. Perrin.

FRANCHISES

***Troy, Ala.**—The City Council has granted to W. R. White and associates a franchise to build a street railway in Troy.

Los Angeles, Cal.—The City Council has granted a franchise to the Pacific Electric Railway to operate a street railway on Sixth Street between Olive Street and Figueroa Street. [E. R. J., Jul. 3, '09.]

San Diego, Cal.—G. W. Pursell has petitioned the City Council for a franchise to operate an electric railway in San Diego. The railway is to connect San Diego, La Mesa, El Cajon, Bostonia, Lakeside, Poway and Escondido, and is estimated to cost about \$2,000,000. [E. R. J., July 24, '09.]

Meriden, Conn.—The Board of Selectmen has granted a franchise to Francis Atwater, president of Meriden, Middletown & Guilford Railway, to build an electric railway over Middletown Road from the tracks of the Connecticut Company to the town limit. [E. R. J., Aug. 7, '09.]

***Dublin, Ga.**—P. L. Wade, S. M. Kellam, W. W. Bush, A. W. Garrett, W. R. Brigham, A. P. Hilton and W. W.

Robinson have applied to the City Council for a 25-year franchise to operate an electric railway over certain streets of Dublin.

Belleville, Ill.—The City Council has granted a franchise to the Belleville & Interurban Railway to build an electric railway on Ninth Street between Huff Avenue and Illinois Street and on Illinois Street from Ninth Street to the Public Square, Belleville. The company plans to use gasoline motor cars. B. A. Gundlach is interested. [E. R. J., July 17, '09.]

Chrisman, Ill.—The City Council has granted a 50-year franchise to the Paris & Northern Railway, Danville, to operate its electric railway in Chrisman. The railway is to run from Ridgefarm to Paris, a distance of 26 miles. [E. R. J., March 20, '09.]

***Jeanerette, La.**—Henry A. Mentz, New Orleans, has been granted a franchise by the City Council to operate a railway by electricity or other motive power than steam in Jeanerette. The railway which Mr. Mentz proposes to build will connect Jeanerette and other towns of Teche Valley.

Waterville, Maine.—The Board of Railroad Commissioners has rendered a decision approving the amended petition of the Portland, Gray & Lewiston Railroad to build an electric railway between Auburn and Portland via New Gloucester, Gray, Cumberland and Falmouth. [E. R. J., Jan. 2, '09.]

Westfield, Mass.—The Western Massachusetts Street Railway has petitioned the Board of Selectmen for a franchise to extend its line in Westfield.

***Clayton, Mo.**—James D. Houseman, St. Louis County, has applied to the County Court for a franchise to build an electric railway from Jefferson Barracks via Maplewood, Webster Groves, Clayton, University City, Ferguson and Florissant to a point near Spanish Lake.

Asbury Park, N. J.—The Township Committee has granted a 34-year franchise to the Asbury Park & Sea Girt Electric Railroad to operate a double track railway over Main Street, Asbury Park.

Brooklyn, N. Y.—The Public Service Commission has adopted a resolution granting permission to the Brooklyn Heights Railroad to change the motive power of the Montague Street route from cable to overhead trolley. The company, when it made the application, stated its intention, if permitted, to run trolley cars from the Wall Street Ferry to Court Street, the present terminal, and over Fulton Street to the Fulton Street Ferry. This would enable passengers to transfer directly to all Brooklyn Rapid Transit cars that come to the Brooklyn Bridge or to the Fulton Street Ferry.

Mount Vernon, N. Y.—The City Council has granted the application of the New York, Westchester & Boston Railway for an amended franchise which will enable the company to continue the construction of its four-track, third-rail line to connect Mount Vernon, Pelham, New Rochelle and other towns, with the Interborough Rapid Transit subway at Bronx Borough.

Utica, N. Y.—The City Council has sold at public auction to the Utica & Mohawk Valley Railway, the highest bidder, a franchise to operate a double-track street railway on Mohawk Street from Bleecker Street to Pleasant Street. C. Loomis Allen, general manager.

***Ironton, Ohio.**—William Lemley, representing A. E. Cox and associates, Huntington, has petitioned the County Commissioners for a franchise to construct an electric railway from Gallipolis to Ironton.

***Ironton, Ohio.**—Thurman Braley, Proctorville, has applied for a franchise to the County Commissioners, to build an electric railway from Ironton to Millersport.

Oregon City, Ore.—The City Council has granted a 25-year franchise to F. M. Swift, of the Oregon City, Beaver Creek & Molalla Railway, to operate through the Mount Pleasant and Green Point sections of the city. Thos. F. Ryan and G. W. Dimmick are also interested. [E. R. J., Aug. 22, '08.]

Bryan, Tex.—The City Council has granted a franchise to Judge V. B. Hudson to construct an electric railway from Bryan to the Agricultural and Mechanical College, a distance of five miles. [E. R. J., Aug. 7, '09.]

Corpus Christi, Tex.—Daniel Hewitt, Salina, Kan., has been granted a franchise by the City Council, to build an electric street railway in Corpus Christi. [E. R. J., Aug. 7, '09.]

Dallas, Tex.—The Northern Texas Traction Company has applied, through its attorney, R. E. L. Knight, to the City Council for a franchise to double track Tyler Street west to the city limits.

Houston, Tex.—The County Commissioners have granted a 28-year franchise to L. A. Anderson representing the Westmoreland Railroad to construct an electric railway from Houston to the Westmoreland Farm near Bellaire, a distance of 7 miles. W. W. Baldwin is an incorporator. [E. R. J., July 31, '09.]

Salt Lake City, Utah.—The County Commissioners have amended the 50-year franchise of the Utah Light & Railway Company to extend its railway from Murray to Sandy and Bingham Junction. By the amendments the company is given until Jan. 1, 1914, to complete its double track to Murray and until Jan. 1, 1911, to complete a macadam road of crushed slag. [E. R. J., March 13, '09.]

Bellingham, Wash.—The Whatcom County Railway & Light Company has applied to the City Council for a franchise to extend its line on Donovan Avenue.

TRACK AND ROADWAY

British Columbia Electric Railway, Vancouver, B. C.—This company has awarded the contract for the construction and grading of the New Westminster and Chilliwack section of its extension, a distance of 12 miles, to the Puget Sound Ditch & Dredging Company. It has also awarded contracts to Palmer Brothers and Peter Henning, Everett, Wash., for the Chilliwack and Abbotsford, B. C., section, which will cost \$150,000. The contractors' headquarters will be at Chilliwack. The contracts call for completion in six months.

***Upland & Claremont Railroad, Los Angeles, Cal.**—William G. Kerckhoff, representing this company, which proposes to build an electric railway from San Bernardino to Los Angeles, has awarded the contract for the first stretch to Garnsey & Pitzer.

San Bernardino Valley Traction Company, San Bernardino, Cal.—Work on the Colton extension of this railway is to be resumed at once, the contract having been awarded to Garnsey & Pitzer, who did the original grading. O. K. Dunham, field engineer for the San Bernardino Interurban Railway, which is the construction company to do the work, will have personal charge of construction.

Colorado Interurban Railroad, Denver, Col.—The financing of this interurban system is said to have been successfully consummated and the work of constructing the proposed electric railway to connect Denver, Brighton, Fort Lupton, Greeley and other towns of the northern coal district, will commence within a few weeks. C. H. Pierce is general counsel for this company. [E. R. J., Nov. 28, '08.]

Norwich, Colchester & Hartford Traction Company, Norwich, Conn.—This company has completed all surveys for its proposed electric railway and expects to begin construction soon. It is hoped to have the first 15 miles in operation next year and complete the road by 1911. This will give a direct route between Norwich and Hartford, a distance of 40 miles. [E. R. J., Jan. 2, '09.]

Cienfuegos, Palmira & Cruces Electric Railway & Power Company, Cienfuegos, Cuba.—This company expects to place contract within two months for the construction of 39 miles of railway from Cienfuegos to Manicargun. Contract for rails has been closed with the Lorain Steel Company, Lorain, Ohio. Hugh J. Reilly, Cienfuegos, Cuba, contractor, desires to buy two gasoline motor cars, but the company has a concession for the development of water power and will probably use electricity as motor power. Bruno Diaz, Cienfuegos, president.

Sanford (Fla.) Traction Company.—It is stated that this company has ordered material for completing its electric railway from Sanford to Everglades and that work will be started within two weeks. The road will be extended to Orlando, making a total distance of 8 miles. A. P. Connelly is manager of the company. [E. R. J., Sept. 10, '09.]

Belleville & Interurban Railway, Belleville, Ill.—This company is said to have ordered 20,000 ties for the construction of its railway, which is to connect Belleville and Smithton, a distance of 10 miles. Jacob Gundlach and Thos. A. Bell, St. Louis, Mo., are said to be interested in this project. [E. R. J., July 17, '09.]

Rock Island Southern Railroad, Monmouth, Ill.—A bonus of \$10,000 has been raised by the people of Aledo to be given to this company in consideration of the building of a branch line into Mercer County.

Fort Wayne & Toledo Electric Railway, Harlan, Ind.—This company is making location maps and profiles for its proposed electric railway from Fort Wayne and Maysville, Ind., to Hicksville, Bryan and Toledo, Ohio, a distance of 42 miles. It is expected that construction will be started about Sept. 15, by the Keystone Construction of Indiana, which has the contract for building the road. The railway

will be standard gage and will be operated by the overhead trolley system. The power will be furnished by the Toledo & Indiana Railway. Capital stock, \$200,000, preliminary, bonds authorized, \$1,000,000. Company address, E. A. Tennis, president, Garden City, Kan. Officers: Chas. H. Baker, 3704 Spruce Street, Philadelphia, Pa., vice-president; Robert T. Bastress, Jr., secretary and treasurer, and W. H. Cost, chief engineer, Harlan. [E. R. J., July 31, '09.]

Gary, Hobart & Valparaiso Traction Company, Hobart, Ind.—B. A. Mapledoram, general manager of this company, writes that all plans for building the railway to connect the cities named in the title are ready and that the road will be graded and the culverts put in this fall preparatory to pushing construction work in the spring. [E. R. J., May 22, '09.]

Sioux City & Eastern Traction Company, Climbing Hill, Ia.—It is stated that the proposed Sioux City, Climbing Hill & Ida Grove Electric Railway will soon be incorporated as the Sioux City & Eastern Traction Company. R. H. Baldwin, Chicago, Ill., engineer, is making the preliminary surveys. [E. R. J., July 14, '09.]

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—This company expects to make improvements which will involve an expenditure of \$500,000. An extension from Denver Junction to Waverly, a distance of six miles, will be constructed and much reconstruction and double tracking between Waterloo and Cedar Falls will be done. All the bridges will be replaced with concrete arches and a steel arch bridge will replace the present viaduct. A new car house and shops will be erected and the capacity of the power station will be increased. C. D. Cass, Waterloo, is general manager.

Arkansas Valley Interurban Railway, Wichita, Kan.—This company is reported to have completed the preliminary surveys of its electric railway from Wichita to Hutchinson, a distance of 50 miles, via Newton. J. B. Hodgson is constructing engineer. [E. R. J., July 17, '09.]

Kentucky Electric Railway, Providence, Ky.—W. G. Roney, secretary of this company, announces that plans for the financing of this railway are not yet completed, so no definite date is yet set for commencing construction. The railway, which is to connect Providence, Nebo, Madisonville and Dawson, 22 miles distant, will be standard gage and operated by the overhead trolley system. The power stations will be located at Dawson and Providence. Capital stock, \$10,000, preliminary, to be increased to \$300,000; bonds, authorized, \$300,000. Officers: J. T. Edwards, president and general manager; B. H. Roney, treasurer, Providence; Ben Sisk, Silent Run, vice-president, and R. D. Orsburn, care J. T. Edwards, Providence, chief engineer. [E. R. J., July 24, '09.]

***Belfast, Maine.**—The surveys for the electric railway from Camden to Belfast have been completed and work will begin the present season. The charter of this railway is held by the Waldo Street Railway, some of the directors of which are identified with the Rockland, Thomaston & Camden Street Railway, although this company is not concerned in the new project. John A. Jones, Lewiston, engineer.

***Aroostook Valley Railroad, Presque Isle, Maine.**—A. R. Gould, Presque Isle, president, advises that the grading of this standard-gage electric railway to connect Presque Isle and Washburn, 12 miles distant, is practically completed. The roadbed is of steam railroad construction, and also the bridges and culverts. The heaviest grade will be $\frac{1}{2}$ of 1 per cent and the sharpest curve 5 deg. The company will use 70-lb rails. All equipment has been purchased. An electric locomotive will be used for freight. The company has retained Murray Brothers, Houlton, to construct the railway. The repair shops are to be located at Presque Isle. The 1200-volt trolley system will be used and power will be furnished from the power station of the Maine & New Brunswick Electrical Power Company, Ltd., at Aroostook Falls, of which Mr. Gould is general manager. The company also intends laying out an amusement resort, but has not decided upon the location of it. Capital stock, authorized, \$100,000; issued, \$100,000; bonds authorized, \$300,000. Officers: A. R. Gould, president, general manager and purchasing agent; A. E. Irwing, Presque Isle, vice-president; H. W. Heath, Augusta, secretary; Fred Barnes, treasurer; Ross Thomson, superintendent; E. S. E. Mosher, electrical engineer, and W. A. Arthur, chief engineer, all of Presque Isle.

Hannibal & Jefferson City Interurban Traction Company, Mexico, Mo.—C. W. Gaiher, secretary of the Mexico, Santa Fé & Perry Traction Company, advises that the property of the Hannibal & Jefferson City Interurban Traction Company is controlled by the Mexico, Santa Fé & Perry Traction Company. Mr. Gaiher also writes that 8 miles of grade is completed on the standard gage electric

railway which his company is constructing to connect Hannibal, New London, Perry, Santa Fé, Mexico, Columbia and Fulton. Capital stock, authorized, \$850,000; issued, \$140,000. Bonds, authorized, \$850,000. Officers: Matthias Crum, president; C. C. Heizer, vice-president; W. W. Botts, treasurer, and S. L. Robison, general manager, Mexico; C. O. Thon, Belleville, Ill. [E. R. J., July 17, '09.]

Grand Valley Railway, Brantford, Ont.—This company is double-tracking Colborne Street and relaying all the old track of the Brantford Street Railway with 80-lb. T-rails. A. S. C. E. section. The company purchased the rails from the Algoma Steel Company. All special work is being furnished by Edgar Allen & Company, Sheffield, England.

Irwin-Herminie Traction Company, Irwin, Pa.—It is reported that this company has about completed its electric railway from Irwin to Herminie, a distance of 4 miles. John S. Pearce is interested. [E. R. J., June 5, '09.]

***Spartanburg, S. C.**—F. H. Knox, Pittsburg, vice-president and general manager of the Electrical Manufacturing & Power Company; J. B. Lee, president of the Glenn Springs Hotel Company, and A. L. White, president of the Merchants' & Farmers' Bank, are said to be interested in the proposition of constructing an electric railway from Spartanburg to Glenn Springs and Union.

***Medicine Mound, Tex.**—W. J. Johnson and associates are at work securing bonuses and townsites for the proposed electric railway to be built from Quanah to Medicine Mound, a distance of 18 miles. Hillsboro, Tex., and St. Louis, Mo., capitalists are behind the enterprise. Mr. Johnson may be addressed, care of Porter A. Whaley, Quanah Chamber of Commerce, Quanah, Tex.

Helper Western Railway, Helper, Utah.—John F. Williamson, president, advises that this company will construct a standard-gage steam railroad, instead of an electric railway as reported in a recent issue. [E. R. J., July 24, '09.]

Whatcom County Railway & Light Company, Bellingham, Wash.—This company announces that it has material on hand and is relaying 9000 ft. of 40-lb rails with 73-lb rails and paving with asphalt, and that it also has material and apparatus for constructing 2900 ft. of track to Lehome Wharf and for an extension of 15,400 ft.

Fairmont & Northern Traction Company, Fairmont, W. Va.—This company announces that its railway connecting Rivesville, Federal, Fairview and Fairmont, 14 miles, is chiefly controlled by the Fairmont & Clarksburg Traction Company, and that all contracts for construction will be awarded by that company. Clement L. Shaver, Fairmont, is interested. [E. R. J., July 24, '09.]

SHOPS AND BUILDINGS

Fresno (Cal.) Traction Company.—This company has selected a site near Pollasky for the erection of the car houses, which are to be built this fall.

Freeport Railway, Light & Power Company, Freeport, Ill.—Plans are being drawn for the car houses of this company to be erected on the East Side, Freeport.

Atlantic Shore Line Railway, Sanford, Maine.—This company announces that it expects to place contract within a week for a car house and office at Kennebunk. Edw. B. Kirk, general manager.

Interborough Rapid Transit Company, New York, N. Y.—This company is to erect a station at Westchester Avenue and Intervale Avenue, Bronx, on the West Farms division of its subway, midway between the present station at Simpson Street and at Prospect Avenue, which are 16 blocks apart.

York (Pa.) Railways.—This company is building a trolley freight station and waiting room on its grounds on Main Street.

POWER HOUSES AND SUBSTATIONS

Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Ia.—This company has let contracts for the improvement of its power house at Cedar Rapids, aggregating \$125,000. A concrete smoke-stack is being built, which will be 210 ft. high, with an inside diameter of 16 ft. at the base and 10 ft. at the top. The capacity of the power plant will be increased to 8000 kw. H. M. Byllesby & Company, Chicago, Ill., are the consulting engineers for the work. [E. R. J., July 3, '09.]

***Hagerman, Idaho.**—H. A. Stroud and associates, Hagerman, are formulating plans for the installation of a 75,000-hp electric plant and the construction of electric railway.

Memphis (Tenn.) Street Railway.—Meers & Dayton, Chattanooga, have been awarded the contract for the erection of the 3-story addition to this company's power house on Broadway Avenue. The contract calls for the completion of the work within four months.

Manufactures & Supplies

ROLLING STOCK

Lexington (Ky.) Railway has recently constructed one freight car in its own shops.

Illinois Traction System, Champaign, Ill., has ordered 10 pay-as-you-enter cars from the Danville Car Company, for use in Champaign.

Chicago (Ill.) Railways has ordered 350 quadruple motor equipments for replacement from the Westinghouse Electric & Manufacturing Company.

San Diego (Cal.) Electric Railway, it is reported, expects to build 12 new large cars to be equipped with air brakes, in its own shops, turning out two cars a month until the 12 are finished.

Detroit (Mich.) United Railways is remodeling 100 cars for pay-as-you-enter service on its lines. The 50 new cars mentioned in the *ELECTRIC RAILWAY JOURNAL* of Aug. 7, 1909, will also be of the pay-as-you-enter type.

Illinois Traction System, Champaign, Ill., has ordered 50 40-ton coal cars from the American Car & Foundry Company. When these cars are delivered the company will have more than 400 cars of this type in operation on its lines.

Louisville (Ky.) Railway has placed an order for 33 pairs of trucks with the Baldwin Locomotive Works. The cars under which these trucks are to be used are being built by the St. Louis Car Company, as reported in the *ELECTRIC RAILWAY JOURNAL* of July 31, 1909.

Scioto Valley Traction Company, Columbus, Ohio, has purchased three additional freight cars from the Barney & Smith Car Company, Dayton, Ohio. They are 36 ft. long, of the box-car type with a few changes, and a capacity of 60,000 lb. Midvale rolled steel wheels are used. The company now has nine cars of this style operating over its lines.

Durham (N. C.) Traction Company has purchased two double-truck car bodies from the Southern Car Company. The cars have a body length of 21 ft. 9 in.; over vestibule, 31 ft. 9 in.; have wood bodies with wood and metal stringers, and are finished on the interior with mahogany. Hunter car signs, National Fare Register Company's fare boxes, Consolidated fenders, Electric Service Supplies Company's gongs, Brill E-39 trucks and two 101-B Westinghouse and two GE-67 motors were specified.

Buffalo & Lackawanna Traction Company, Buffalo, N. Y., has drawn up the following specifications for the 10 double-truck pay-as-you-enter cars ordered from the Cincinnati Car Company, as mentioned in the *ELECTRIC RAILWAY JOURNAL* of July 10, 1909:

Wheel base	4 ft. 10 in.	Curtain material	Pantasote
Length of body	29 ft.	Hand brakes	Peacock
Length over vest.	41 ft. 8 in.	Heaters	Consolidated
Length over all	43 ft.	Headlights	Dayton
Width over all	8 ft. 7 in.	Motors	2
Height sill to trol. base	9 ft.	Roofs	Monitor deck type
Hght. top rail to sills	33 1/4 in.	Sanders	Nichols-Lintern
Body	Composite	Sash fixtures	Dayton
Underframe	Composite	Seats	Hale & Kilburn
Air brakes	West., SME	Trolley retrievers	Knutson
Couplers	Cinn. Radial	Track scrapers	Root
Curtain fix.	Curtain S. Co.		

The interior will be finished in cherry and the side walls lined with Agosote.

TRADE NOTES

Grip Nut Company, Chicago, Ill., has changed its address from 1590 Old Colony Building to 575 Old Colony Building, Chicago.

Root Spring Scraper Company, Kalamazoo, Mich., has shipped 24 of its scrapers to the Grand Rapids (Mich.) Railway. When these scrapers are installed all of the cars operated by this company will be equipped with this type of scraper.

Hurley Track Laying Machine Company, Chicago, Ill., has leased one of its machines to the Manistee & North Eastern Railroad to lay the track on an extension in Michigan. With this machine and 28 laborers, one mile of track per day is being laid and quarter-spliced. At times the machine hauls the material train of 14 cars up a 6 per cent grade over a rough roadbed.

Electrical Securities Corporation, New York, N. Y., has changed its name to the Engineering Securities Corporation. This company has been in existence for some years, owning securities and occasionally participating in underwritings or other issues of securities. It now deals actively

in high-grade securities of engineering enterprises. Robert T. Lozier has been appointed special representative of the company.

Western Electric Company, New York, states that its sales during the last seven months were at the rate of \$46,000,000 per annum, and that those during June were 35 per cent larger than those of June a year ago. The greatest gain has been in the Middle West, and the Pacific Coast section shows the next greatest improvement. The export business has shown great activity and that in June was about twice that of June, 1908. The company has also recently received by cablegram an order to supply a complete common battery telephone plant to the City of Peking. This order was received from the Chinese Government and the plant will be by far the largest of any of its kind in China. It amounts to \$150,000 and will be installed under the supervision of one of the Western Electric engineers who will be sent to Peking for that purpose.

McKeen Motor Car Company, Omaha, Neb., has under construction a gasoline motor car for the Rock Island Railroad and a gasoline motor car for the Hocking-Sunday Creek Traction Company, which is building a railway in Ohio. The company also has orders from the following lines for motor equipment: St. Joseph & Grand Island Railroad, Southern Pacific Railway, Union Pacific Railroad, Oregon Railway & Navigation Company, Salem, Falls City & Western Railroad. One of the company's 70-ft. motor cars is now en route on its own wheels, and under its own power to New York, where it will go in service on the Erie Railroad. This makes two cars designed by the McKeen Motor Car Company to be purchased by the Erie Railroad. In fact, 22 railroads are operating McKeen cars or have cars on order, and a total of 47 McKeen cars is in service in the United States, 23 being in use on the Pacific Coast.

ADVERTISING LITERATURE

Frank Ridlon Company, Boston, Mass., has issued its list of second-hand electrical machinery for August, 1909.

Edge Moor Iron Company, Edge Moor, Del., has just published a new edition of its catalog of water-tube boilers, which also contains a description of a new reinforced screwed pipe connection for inserting pipes in boiler or tank plates.

Berry Brothers, Ltd., Detroit, Mich., have published a unique children's book of illustrated verse describing a trip around the world in a "Berry Wagon," which bears the advertisements of this company's varnishes and architectural finishes.

Terry Steam Turbine Company, Hartford, Conn., has issued catalog No. 3, describing the construction and operation of Terry low-speed steam turbines. These prime movers are of the compound velocity stage, impulse type, and are made in sizes from 10 to 300 hp. The smallest units run at a normal speed of 3200 r.p.m. and the largest sizes at 1650 r.p.m.

J. P. Devine Company, Buffalo, N. Y., maker of vacuum drying and impregnating apparatus under the Emil Passburg patents, has issued a list of users of Passburg apparatus which shows more than 2000 installations in successful operation. Among the electric railway companies in the list are the Metropolitan Street Railway, New York; Cincinnati (Ohio) Traction Company; Indiana Union Traction Company, Anderson, Ind.; Philadelphia Rapid Transit Company; Public Service Railway; Twin City Rapid Transit Company, and the Berlin (Germany) Tramway.

Stone & Webster Engineering Corporation, Boston, Mass., gives an account of the method by which the Lincoln station, Harvard station and Charlestown station of the Boston Elevated Railway were enlarged under the supervision and direction of the Stone & Webster Engineering Corporation in a handsomely printed and illustrated pamphlet entitled "Came the Power with the Need." Briefly stated, the Boston Elevated Railway Company found in February, 1907, that it was in urgent need of 10,000-20,000 additional horse-power and called in the assistance of the Stone & Webster Engineering Corporation. Its contract with the railway company was on a cost-plus-a-percentage basis. This enabled it to commence work at once on the extensions to the existing stations required to house the new machinery and to place the necessary orders. By the middle of October, 1907, the first of the new 4200 hp engine-generators with their boilers and auxiliaries were in operation, and before Dec. 1 of the same year the entire installation of four of these equipments was under full load. The pamphlet describes the organization effected for carrying on this work and the technical details of each installation. It also presents views of the three different stations while in different stages of construction and also of the completed work.