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RENAISSANCE OF THE DOUBLE-DECK CAR

A preliminary description of a double-deck car which is now being built for the Washington Railway & Electric Company is published elsewhere in this issue. It is the fourth car of the type to be ordered within the past eight months, and it would indicate that the double-deck principle is now arousing much less skepticism than has been the case during the past decade. The fact that double-deck cars were once tried in this country and found wanting does not necessarily mean that the present cars are to prove failures. Ten years or more ago little need existed for such types and neither the problem of physical design nor that of handling fare collections was understood. To-day the successful development of the small wheel, the low entrance and the prepayment principle have made the double-deck car a practical possibility, while the incentive always so necessary to success is supplied by the desperate need which exists in many communities for some means to halt the rapidly rising cost of operation.

THE LOW-CAR- STEP ORDER IN NEW YORK

The Public Service Commission's order lowering car-step heights in New York City, which is published elsewhere in this issue, is an action that has been expected for some time past. Little reason now exists for the imposition upon the public of excessively high steps, and as we have heretofore pointed out a reduction in height even on the cars in service to-day may be effected at a cost which is by no means prohibitive. Aside from the inclined floor, the use of the small car wheel and the small motor, while involving a very much greater initial expense than remodeling the platforms, has been shown to effect enough saving in weight and, consequently, in cost of energy to pay the interest charges on additional investment. The order of the commission establishing as a maximum a 15-in. height for car steps in Greater New York does not, how-

ever, necessarily involve any radical changes in design, although it is estimated that the cost of the change will amount approximately to \$95 per car. It is to be hoped that while the companies are making the changes they will not content themselves with a reduction in height from 16 in., or in the worst reported case 17½ in., to the exact maximum of 15 in. Little additional expense would be involved by establishing the first step at an appreciably lower elevation with a consequent increase in the ease and rapidity with which passengers may board and alight from the cars.

PREPARING FOR ELECTRIFICATION OF STEAM ROADS

No event has happened more significant of the near approach of general steam railway electrification than the establishment of the Pennsylvania Railroad's correspondence school of electricity. Electrification of trunk lines has for a long time been one of those things that were "sure to come," but it has not as yet got much beyond terminal districts. The management of the Pennsylvania not only has its plans made for electrification of its line from New York to Washington, D. C.; it realizes that, in addition to the elementary needs arising out of the many present applications of electricity, it will soon be necessary for its trainmen and shopmen to be equipped for the operation of an electrified system. The men themselves have been so quick to see the point that within thirty days of the announcement that the school would be started 10,000 Pennsylvania employees, representing almost every department, have enrolled as electrical students. A brief account of the course of study to be followed is given elsewhere in this issue. It is extremely elementary, but if the average street and interurban electric railway employee were even so well educated as will be the men who pursue the Pennsylvania's course of correspondence study the life of electric railway officials would be an easier one. Is there not in this a suggestion worth the consideration of these officials? If it pays a steam railroad to educate its employees against the day of electrification, would it not be a good move for railways already electrically operated to carry their educational effort beyond the superficial and ill-grounded training that a motorman, for instance, receives when he is learning to take charge of a car? Something in this direction has been done by some roads, but not enough to enable us to say truthfully that the electric railways may not profit by the example set by their big brother of the steam lines.

MAINTENANCE ON THIRD AVENUE SYSTEM

The annual report of President Whitridge of the Third Avenue Railway, New York, covering the calendar year 1912 contains references to matters that are of general interest. A group of tables in the report details estimates of capital and some operating expense requirements for 1913. It appears from these that of the total estimated requirements of \$1,596,653 \$880,264 will be

added to capital and \$716,389 will be charged to operating expense account. The practice of showing these details is unusual. The estimated charge to capital account for 1913 is about 2.6 per cent of the investment in road, equipment, buildings, etc., as of the close of the last calendar year. The report shows that the system as a whole had gross earnings of \$9,547,529. The operating ratio was 61.27 per cent. The proportions of gross expended for various purposes were as follows: operation of cars, 25.76 per cent; power supply, 7.81 per cent; injuries to persons and property, 4.94 per cent; general and miscellaneous expenses, 7.11 per cent; maintenance of way and structures, 9.17 per cent; maintenance of equipment, 6.47 per cent. While the maintenance expenditures which are charged in this way thus amounted to 15.64 per cent of gross, they do not show the total provision for upkeep of the property because there was a deduction from income on account of depreciation of \$400,000. This additional amount is equal to 4.19 per cent of gross operating revenue and it makes the total expenditure and allowance for maintenance and depreciation 19.83 per cent of gross.

The actual outlay which was made for maintenance of way averages \$2,759 per mile of track, but this does not include as large an expenditure for the replacement of rails as would have been made had it not been for the difficulties due to corrugation and a belief that replacement of this part of the property should proceed slowly until more is known about the cause of corrugation. The reservation of an amount to cover this and other possible accruing or accrued depreciation makes the operating ratio, including the provision for depreciation, 65.46 per cent.

VITALIZING INFLUENCE OF THE ELECTRIC RAILWAYS

Benefits of electric railway service in rural communities formerly without transportation facilities are well known to economists, but they will bear restating at times when comprehensive developments are being considered by the public authorities. One of the most thorough studies of the relation of electric railways to rural towns which have thus far appeared in print has lately been published by the State of Massachusetts under the title of Senate Document 300.

For several years a very large part of the western half of the State has been seeking legislation which will encourage the building of trolley lines through sections at present unprovided with transportation service, and in response to this demand a joint special committee of the Legislature has investigated the situation and embodied in the above publication its recommendations in favor of the desired development, which is proposed along lines of co-operation with the New York, New Haven & Hartford Railroad Company.

Apart from the interest of the problem of steam railroad and street railway relations, the bearing the proposed development has upon the industrial life of the sections concerned is of wide significance. Many of the rural communities seeking trolley service have become more and more decadent with the passing years instead of increasing in population and industrial activity. As the report of the

committee points out, it is impossible to escape the conclusion that a large part of this economic deterioration is due to the absence of transportation facilities, since other communities with no greater natural advantages but which are provided with steam and trolley service have shown a healthy growth in population, land values and agricultural and industrial products. Electric express service, notably on the Berkshire system, has increased the production of farms, encouraged the growth of small factories and water powers, improved the living conditions in winter, opened the territory to summer residential uses and enabled the educational advantages of the larger centers to be reaped by pupils from remote districts who in many cases would otherwise be deprived of anything more than a country schooling.

Exactly the opposite experience is that of the communities without transportation facilities. In many such localities can be seen abandoned farms, unproductive forests, unused mill sites and shrinking populations. In many places it was shown to the committee that the cost of transportation to shipping points was more than the cost of production. Such occupations as the raising of potatoes, of cattle for dairy farming and of sheep have been practically abandoned for lack of transportation.

West of the Connecticut River eleven towns having an aggregate area of 325 sq. miles, without a mile of steam railroad or trolley in any one of them, possess no more modern facilities for the transportation of persons or merchandise either into or out of the communities than existed ninety years ago, before the introduction of railroads anywhere into Massachusetts. Their combined population has fallen in this period from 11,769 to 5377. In another similar section of 316 sq. miles eight towns without transportation facilities have decreased in population from 9588 to 4632 in the past ninety years. The population of the communities which are reached by the four principal railroad lines in the five western counties of the State increased during this period from 91,879 to 652,744, or 610 per cent; while in the same counties the population of the thirty-three towns still without railroad or street railway facilities has decreased from 39,847 to 14,143, or an average decrease of 54.1 per cent.

Evidence presented during the investigation of the trolley development problem showed that with electric railway facilities better milk would be marketed in many of the larger centers, teaming costs now prohibitive would be cut to nominal figures by electric express service, a high-school education would be available for many pupils who cannot meet the expense of boarding away from home during the school year, farm labor would be more easily secured in the towns, products locally wasted would in large measure be transported to the cities, and timber and water power now undeveloped would be utilized to the profit of their owners. Points 10 miles or 15 miles from the nearest railroad station would be brought in touch with the outside world and commerce would begin to thrive. The committee's report sets forth the vitalizing influence of local transportation in a manner which leaves little to be desired and its value as a contribution to the larger discussion of electric railway influences in country districts is apparent to every thoughtful reader.

INCREASING THE EFFICIENCY AND RELIABILITY OF OLD EQUIPMENT

Changes in the design of cars and equipment have been so rapid during the last few years that types which but a short time ago were considered the last word in design are now looked upon as obsolete. The problem of maintaining these cars is not confined alone to keeping them in good operating condition. The desire to effect economies in operation as well as to increase their safety and provide better entrance and exit facilities makes it necessary for operating engineers to consider improvements that will make such cars agree more nearly with the latest practice.

The demand for a reduction in car weight has been met willingly by the manufacturers. Many engineers have calculated that the saving in the cost of energy from such a reduction was equivalent to a sum varying from \$10 to \$2 per car per annum for every 100 lb. reduction. The saving in each case must depend, of course, not only on the cost of energy delivered at the car but also on the average mileage made by the cars and the character of the service, since the watt-hours per ton mile will vary with the schedule speed, number of stops per mile and length of time consumed in stops. One large city system whose surface cars last year made a mileage of over 50,000,000 miles has furnished the following figures: average miles per car per annum, 35,000; average cost per kilowatt-hour of energy at the car, 25 cents; average energy consumption, watt-hours per ton mile, 145; average schedule speed, 8.9 m.p.h.; average number of stops per mile, 6.8; average length of stops, 6.9 seconds. From the equation $(35,000 \times 0.145 \times 1.25 \text{ cents}) \div 20 = \3.17 per 100 lb., it is evident that this road pays \$3.17 per 100 lb. per annum for carrying around the dead weight of a car. Whatever the actual cost may be to any road, such calculations as this have shown the saving that may be expected from weight reductions. Operating companies are therefore making every effort to reduce weights as much as possible and still make certain that such reductions will not increase the cost of inspection and maintenance.

Changes that would necessitate rebuilding of the car body are prohibited on account of the cost involved. A rearrangement of seating, however, could be undertaken on a maintenance basis with little increased cost over what would be required to maintain the original seats. Where it is desirable to increase the seating capacity much can be effected by using cross seats in the center of the car and longitudinal seats at the entrance and exits, an arrangement now very popular because passengers who are standing opposite the doors are thereby prevented from interfering seriously with those who are entering or departing. As an example of what may be accomplished in this direction let us consider a car with inside dimensions of 8 ft. x 30 ft. With longitudinal seats such a car would seat forty-two passengers and the space available for standing passengers would be 90 sq. ft. Such a car could be equipped with sixteen cross seats and two longitudinal seats at each end 5 ft. 4 in. long. With this combination forty-eight passengers could be seated, which is an increase of six over the longitudinal seating, and the space available for standing would be 72 sq. ft.

Trucks of relatively high maintenance cost can sometimes be replaced to advantage with a later type. For example, some recently constructed cars for use in city service with a center pin load of 14,000 lb. are equipped with trucks in which the ratio of complete truck weight to the center pin load is 0.35, whereas in the older types this ratio was as high as 0.45 to 0.5. Stated in another form, this means that a car with a center-pin load of 14,000 lb. now has a truck weighing 4900 lb. instead of 6650 lb., a saving in weight of 3500 lb. per car. At \$3.17 per 100 lb. as the cost of energy consumed, such a reduction would mean a saving of \$110.95 a year in the cost of energy alone, and the first cost of the truck frames could be saved in three years. Furthermore, the energy consumption of the motor equipment would be reduced somewhat by using a truck of ball-bearing, center-bearing type. Anti-friction bearings have also been considered as a means of reducing the energy consumption and tests have shown a reduction of from 18 per cent to 30 per cent in some cases.

Changes that can be made in existing motors or control to effect additional economies are limited. Indeed, such innovations as the addition of interpole fields or the application of field control involve a cost that is prohibitive, and at any rate the full advantage of such alterations would not be obtained unless the armature windings were replaced also. Changes like the following, however, will materially reduce the cost of maintenance for a reasonable expense: impregnation of field coils, slotting of commutators in conjunction with a high-grade carbon brush, installation of a modern design of brush holder, replacement of worn gear cases by a light-weight steel construction, changes in bearings and the method of lubricating them, and the rearrangement of motor leads to give less liability of short-circuits.

A careful study of operating conditions to determine if the gear ratio used is still the most suitable for the service is very desirable and one that will often prove of great advantage in reducing expenses by reducing energy consumption and lowering the temperature of the motors. It is noteworthy that enlightened engineers and manufacturing companies that have made a special study of this point have instituted a campaign against high-speed gearing. Roads that have made changes in their gearing to reduce their maximum speeds are realizing from 5 per cent to 12 per cent saving in energy. In considering the supersession of old motors, the advantages of two-motor equipments in place of four-motor equipments for city service have long been appreciated. Such a change, however, would necessitate going to a maximum traction type of truck or else connecting the two axles of a truck by side rods in order to make all wheels available for adhesion. The motors on a car equipped with four 40-hp motors would weigh about 11,200 lb., while two 80-hp modern motors would weigh but 6730 lb. A saving of 4470 lb. would be the result of the change. In addition to the economies that may be expected by changing equipment and construction, great economy in energy consumption is possible by correct operation of the equipment. Proper acceleration and braking rates should be maintained and particular attention given toward securing the maximum amount of coasting consistent with the service conditions.

Recent Improvements of the Boston Elevated System

A Continuation of the Description of Recent Improvements by the Boston Elevated Railway Company, Including the New Office Building of the Seventh Surface Lines Division, the New Stadium Station, Additional Transportation Facilities at the North Station, Present Power Requirements and Other Features

The ELECTRIC RAILWAY JOURNAL for March 1 contained an article bearing the same title as this which presented a description of further extensions of the rapid transit lines of Boston since the completion of the Cambridge subway, including particularly the improvements at the Sullivan Square terminal and the East Cambridge viaduct. The present article will complete this description of recent betterments.

IMPROVEMENTS AT NORTH STATION

Closely associated with the opening of the East Cambridge extension are improved facilities placed in service at the same time at the North Station, which is now one of the most important transfer points on the system of rapid transit lines. This station now consists of three interconnected platform groups used in connection with the elevated train, viaduct and subway car service, with convenient exits and entrances to and from the street surface and the waiting room and midway of the North Station of the Boston & Maine Railroad. The newer portion of the station is included in the platforms and connections used by the Atlantic Avenue shuttle trains running between the two principal steam railroad terminals of the city and the viaduct cars. The station is now provided with platform accommodations about 410 ft. long on the north side of Causeway Street, these being used by the train and car service above mentioned. A spur track of the elevated lines terminates beside the easterly section, which is 200 ft. long and 12 ft. wide, the headway of the shuttle

and Sullivan Square trains. The viaduct service platforms are from 208 ft. to 238 ft. long and from 8 ft. to 16 ft. wide, located on opposite sides of the inward-bound and outward-bound tracks as shown in the accompanying drawing. They are connected with the midway or passen-



Boston Improvements—Elevated Extension for Viaduct Cars, Causeway Street

ger concourse of the North Station proper by a gallery of reinforced concrete construction about 120 ft. long and 16 ft. wide, with stairways at each end to facilitate entrance and egress. The gallery passes over the carriage



Boston Improvements—North Station Incline, Showing Southbound Tunnel Train Tracks and East Cambridge Viaduct Car, Northbound and Southbound Tracks and Foot Passage

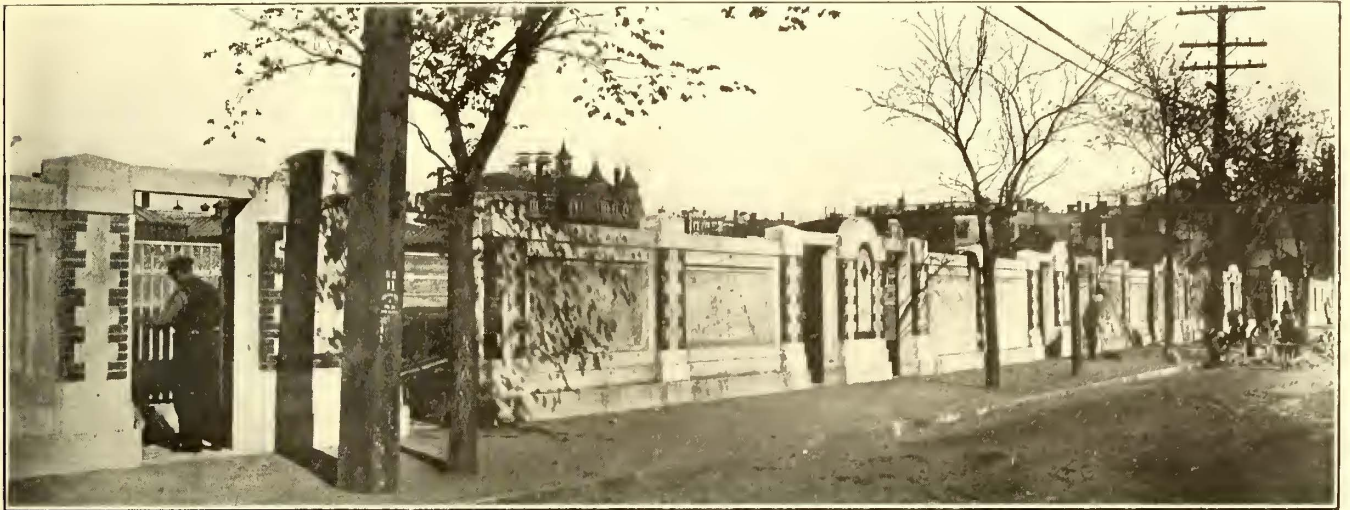
trains being sufficient to permit the use of one track without interference with traffic.

Short stairway connections are provided between the elevated train platform and the viaduct service platforms at the west, together with short connections with the North Station proper and the Washington Street tunnel

and taxicab stand of the station and is provided with direct stairway connections leading to the street at the head of an entrance lobby of semi-circular shape in which the ticket booths are placed. The design of the station provides for the utmost facility of interchange of traffic between the different services entering and leaving the

premises, with ample protection of passengers against rain and snow. The short connections between the steam railroad terminal and the Boston Elevated station also permit cars to be taken to all parts of the system without breaking cover, and also without requiring travelers to

The transfer privileges at the North Station west and in the Tremont Street subway between viaduct cars, elevated trains and other subway cars provide for a bodily transfer from line to line without the use of checks. In case passengers wish to travel farther south than the sub-



Boston Improvements—Fence Outside the Stadium Station

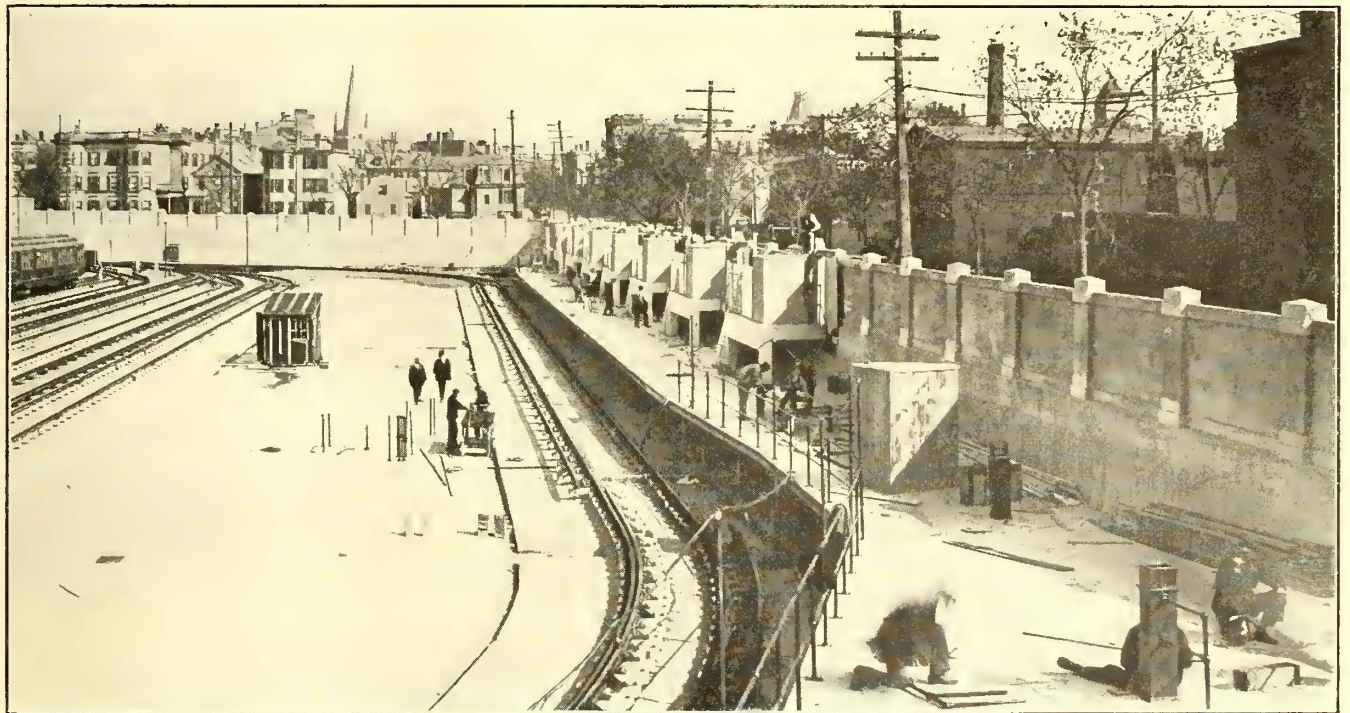
cross the street surface, where the congestion of teaming and vehicular traffic is at times excessive.

The entrance to the station from the railroad concourse is equipped with two transparencies advertising the company's service, these being mounted at the top of iron standards about 15 ft. high and containing in each case four circuits of eleven 55-volt, 4-cp carbon incandescent lamps. Small tungsten lamps will be substituted soon for the carbon-filament units to reduce the amount of heat

way cars run they are also enabled to change without expense to them at the Haymarket Square station of the Tremont Street subway, where passageways connect with the Union-Friend station of the Washington Street tunnel. The viaduct lines all include the Tremont Street subway, with connection at Park Street to substantially all parts of the system on the south and west.

THE STADIUM STATION

One of the most interesting improvements on the sys-



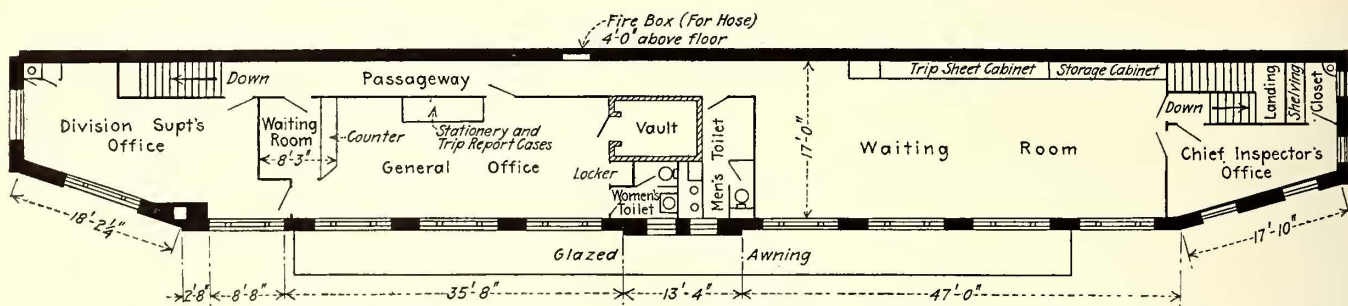
Boston Improvements—Stadium Station Nearing Completion

given off within the transparencies. The platform lighting is at present effected with carbon-filament incandescent lamps spaced from 8 ft. to 10 ft. apart over platform edges and from 16 ft. to 20 ft. apart at the rear. The lamps are usually mounted from 10 ft. to 12 ft. above the platform surface.

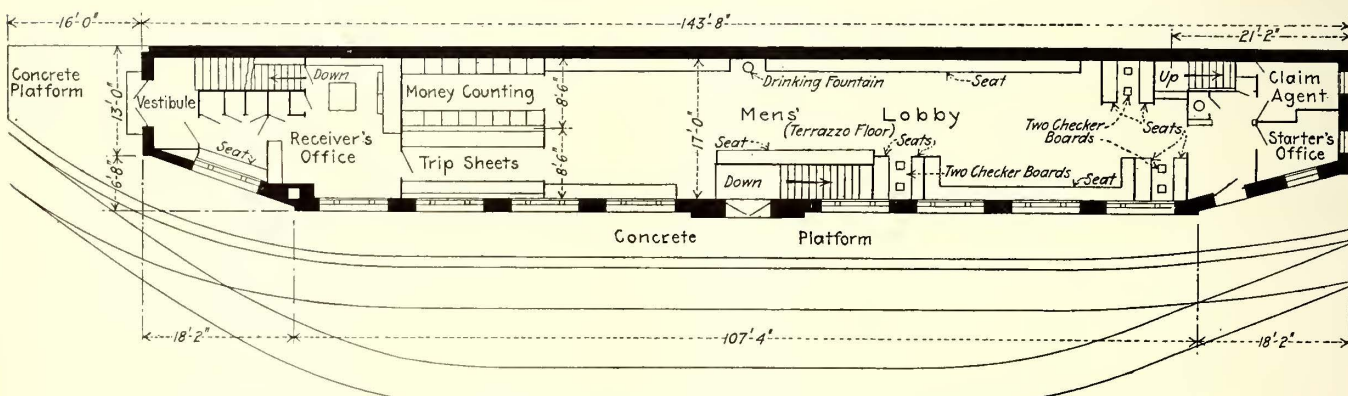
tem is the new Stadium station, in Cambridge, which is utilized by the company in connection with the handling of traffic at times of football games or other athletic events of Harvard University conducted in the Stadium or upon Soldiers' Field. More than 35,000 spectators frequently attend a single game during the football season, and the

handling of the extra traffic at such times has been a task of some difficulty on account of the extensive use which has had to be made of surface cars. With the opening of the Cambridge subway and the establishment of new car-house facilities for its trains near Harvard Square, Cambridge, an opportunity was afforded for the building of a special station for occasional use only on the easterly side of

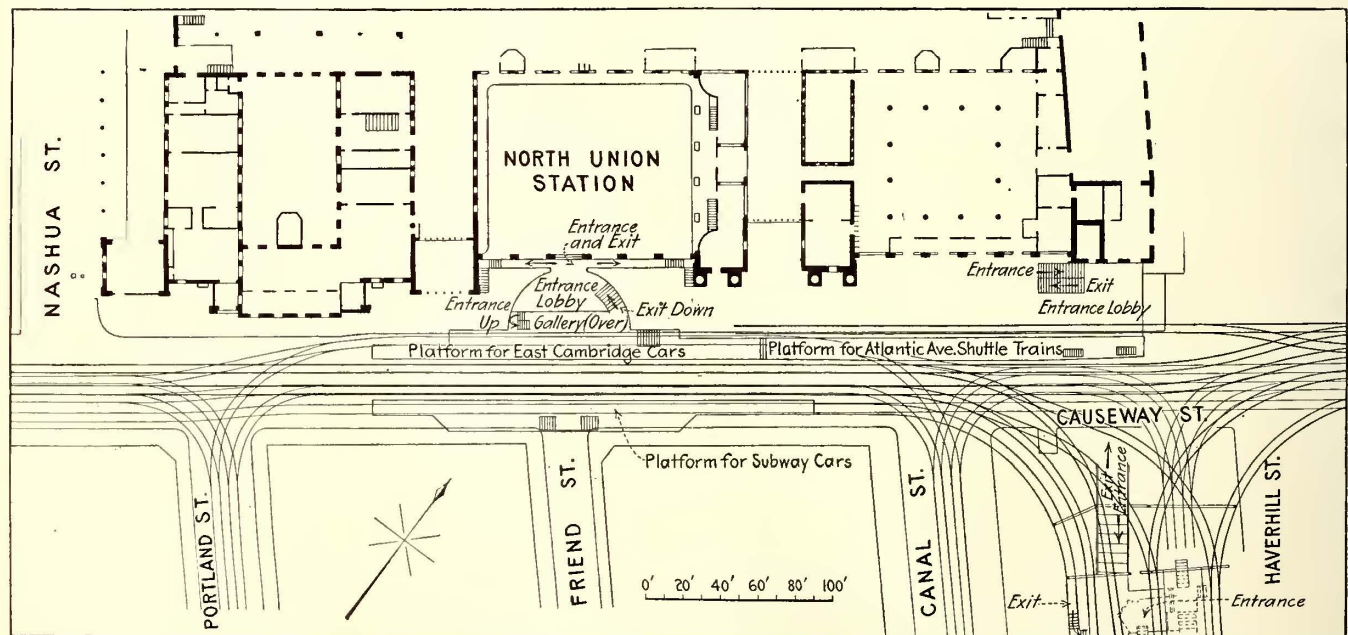
entrance and exit platforms and a ramp at the head of which a main entrance and exit are located. The platform level is equal to that of the car floors, or 3 ft. 11½ in. above the top of the rail. The street outside the platform is above the latter, so that the exits are arranged to open outward from landings 6 ft. wide and 17½ ft. long carried on concrete posts 4 ft. 6 in. above the unloading and



Boston Improvements—Plan of Second Floor, Quarters of Division No. 7



Boston Improvements—Plan of First Floor and Track Lay out, Quarters of Division No. 7



Boston Improvements—Plan of Causeway Street Station A adjacent to the North Union Station

the Eliot Square trainyard. The subway provides transit from Park Street, Boston, to the Stadium station in about ten minutes, compared with a former journey of about forty minutes by surface cars.

Trains are run through from Harvard Square to the Stadium station via a loop track extending around the southerly side of the Eliot Square shops to a reinforced concrete platform 350 ft. long and 15 ft. wide, provided with eight

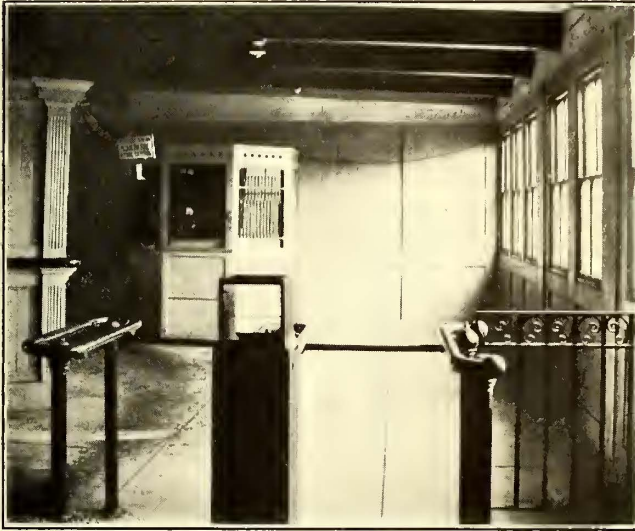
loading platform. A reinforced concrete fence about 2000 ft. long and costing about \$12,000 extends entirely around the yard and shops. The ticket offices are located at the head of the ramp and on the landings, and accommodations for twenty-four ticket sellers are available at the close of each game. The exits are used as entrances by the returning crowd. The exits are about 5 ft. wide and 7 ft. high, with the exception of the two main gates, which are about

7 ft. wide and 6½ ft. high each. Twelve ticket choppers are on duty when the station is open for inward passengers. Trains of four cars each are ordinarily operated in this service upon a minimum headway of one and three-quarter minutes and a platform man is stationed at each car door to facilitate prompt starting. The total operating force required to man the station consists of one starter, twelve platform men, twenty-four ticket sellers

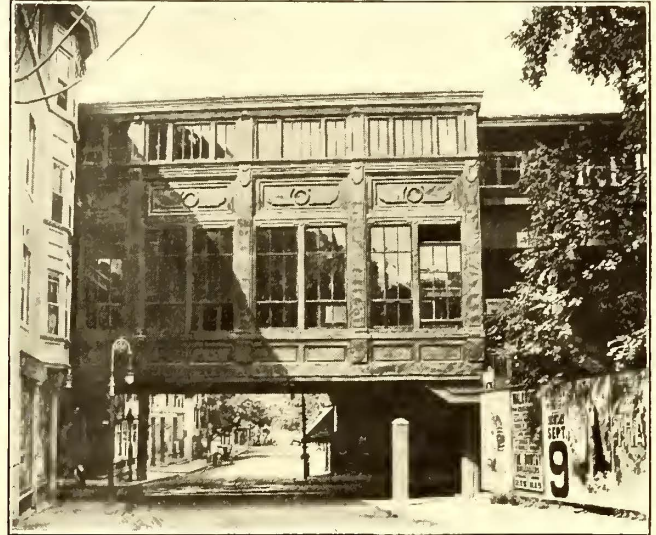
were designed by Robert S. Peabody, consulting architect of the company, and the fence, which is about 7½ ft. high, with 2-ft. posts set at 12-ft. intervals and finished concrete panels between, accords in appearance with the walls standardized for general use around the university section of the city.

OFFICE OF THE SEVENTH DIVISION

The new headquarters building of the Seventh division,



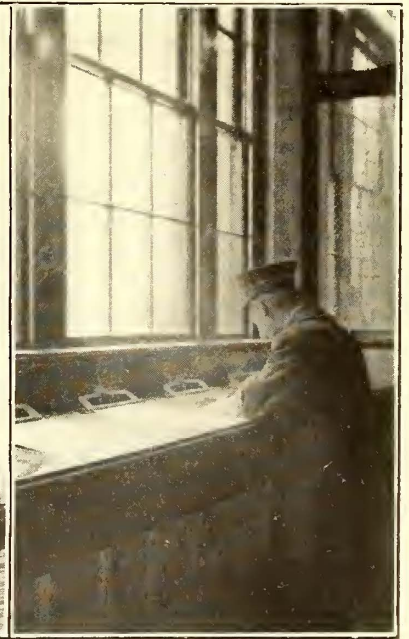
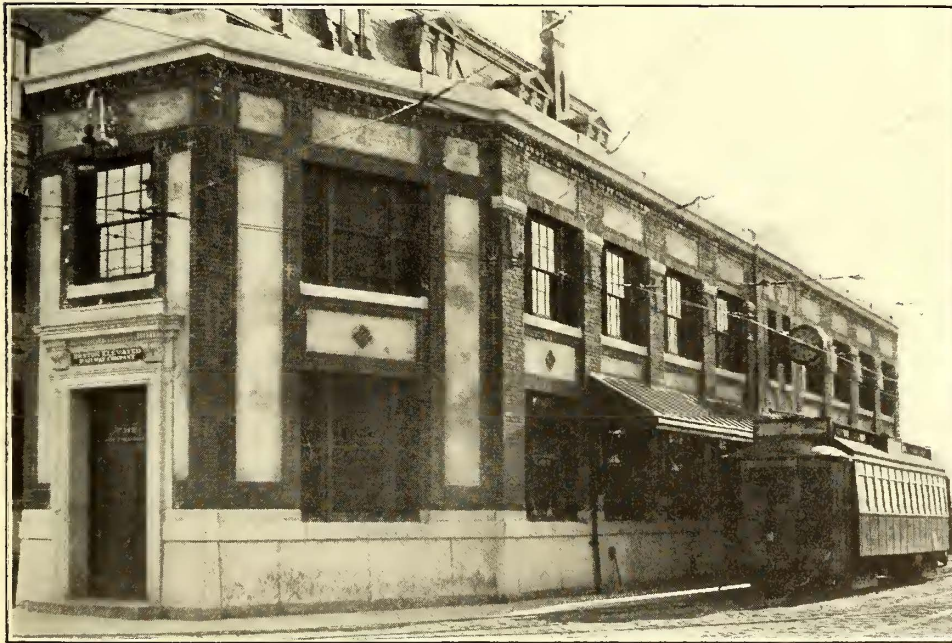
Boston Improvements—Ticket Lobby, North Station



Boston Improvements—Green Street Station

and twelve choppers, or a total of forty-nine employees. During the recent football season about 26,000 passengers were handled at this station in forty-five minutes without mishap or confusion. A company telephone is provided for the use of the starter and train service is maintained for about one-half hour after the game begins

near Harvard Square, Cambridge, represents the company's latest practice and shows the possibilities of making effective use of an extremely limited space. The building occupies a narrow strip of land between the entrance to the Bennett Street yard of the surface line service and the Cambridge police headquarters. It is two stories in



Boston Improvements—Quarters of Division 7 at Cambridge, and Trip Sheet Report Desk in the Lobby

and begun one-half hour before it closes. Two exits are provided at each landing and the main exits at the head of the ramp when added make a total opening of about 94 ft. through which the stream of passengers is subdivided. Temporary lighting is provided during the fall season by five-lamp clusters located above the ticket offices and near the entrances. The architectural features of the station

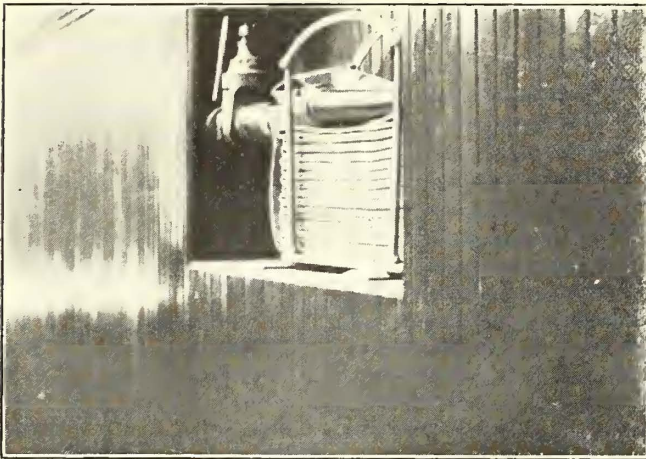
height, with a basement, and is about 144 ft. long by 20 ft. wide, of mill construction with brick walls and concrete trimmings. The first floor is devoted to a receiver's office, including a lost article division with accommodations for inquirers, a conductors' and motormen's lobby about 80 ft. long, and offices for the division claim agent and starter. An attractive feature of the lobby is a special counter

for the making up of trip sheets, which has accommodations for sixteen conductors and spring clamps 16 in. long at the back of the counter, with a 2-in. air space behind to permit the folding backward of sheets when desirable. Opposite the trip sheet counter is a bank of sixteen 26-in. x 26-in. x 7-in. partitions carried 3 ft. 6 in. above the

and above is located a clock illuminated by ten 25-volt, 4-cp lamps wired in series with three 100-volt, 16-cp lamps.

GREEN STREET AND DOVER STREET ELEVATED STATIONS

The transit facilities on the Forest Hills extension of the elevated lines have recently been augmented by the building of a new station at Green Street, Jamaica Plain,



Boston Improvements—Fire Hose and Receptacle in the Quarters of Division 7

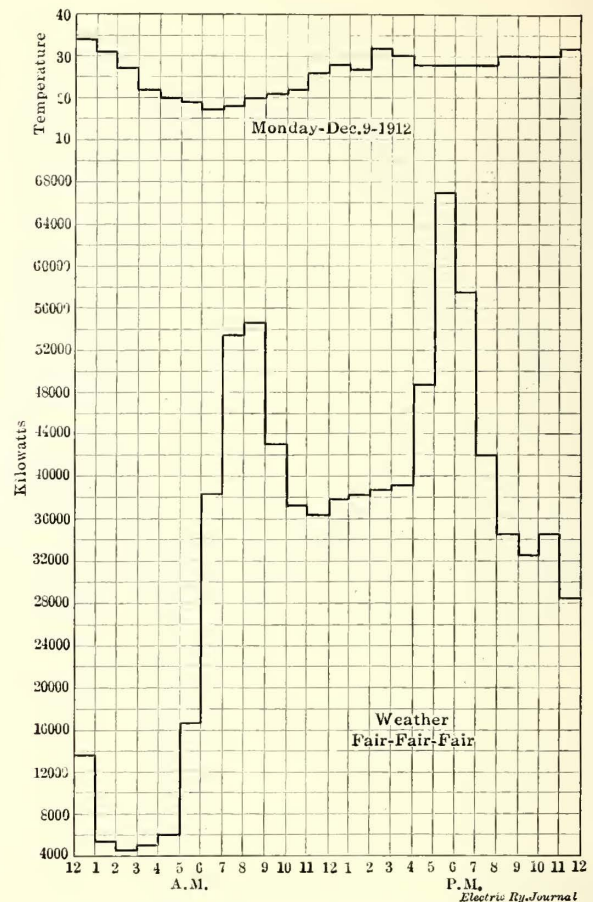
floor and used in the counting of money by conductors at the end of their day's work. Bulletin boards are attached to the wall at the side of the lobby carrying the usual timetables, rating lists, orders and service information, and on the side of the room there are also seats with six checkerboards for the use of the men. The basement is provided with a commodious locker room, a lavatory with ten individual wash basins of the detachable type and a room for the storage of transfers and office supplies. The transfer storage room is provided with a separate passage to the main floor and can be locked on the locker room side if desired.

The second floor contains the office of the division superintendent, a small public waiting room, general offices of the division, quarters for the chief inspector and an assembly room seating about 100 men. In the last named place is located a wall cabinet 33 ft. long in which trip sheets extending back seven years are kept for reference, besides time sheets, stock and other office supplies. The routine business of the division, including the preparation of payrolls, correspondence, etc., is handled in the general

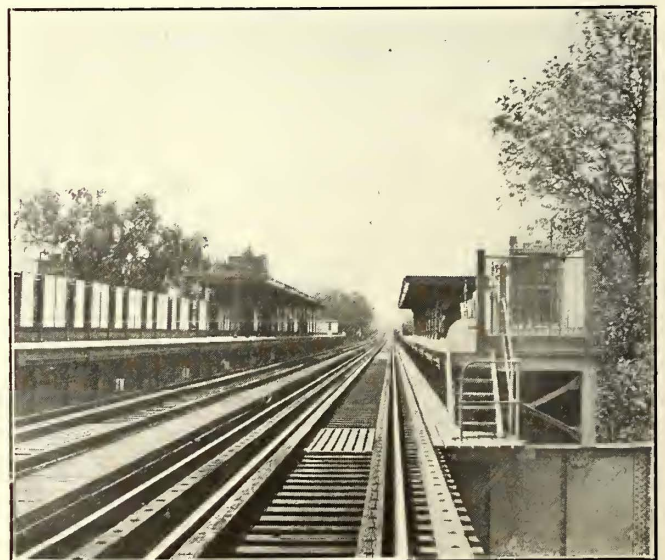


Boston Improvements—Latest Type of Waiting Station, Hyde Park District

office. The assembly room is provided with a buzzer controlled by the division superintendent to save time in summoning employees to the private office. The building is heated by hot water supplied from the company's adjacent Harvard power station. Outside the building a glazed canopy is provided at the side of the surface car tracks,



Boston Improvements—Hourly Kilowatt Record



Boston Improvements—Green Street Station, Illustrating Latest Elevated Design

and in general arrangement and interior finish the station represents an advanced standard of design and construction. It consists of two side platforms of reinforced concrete construction, 365 ft. long and from 8 ft. to 12 ft. wide, for northbound and southbound traffic, and a station building including ticket offices and waiting room

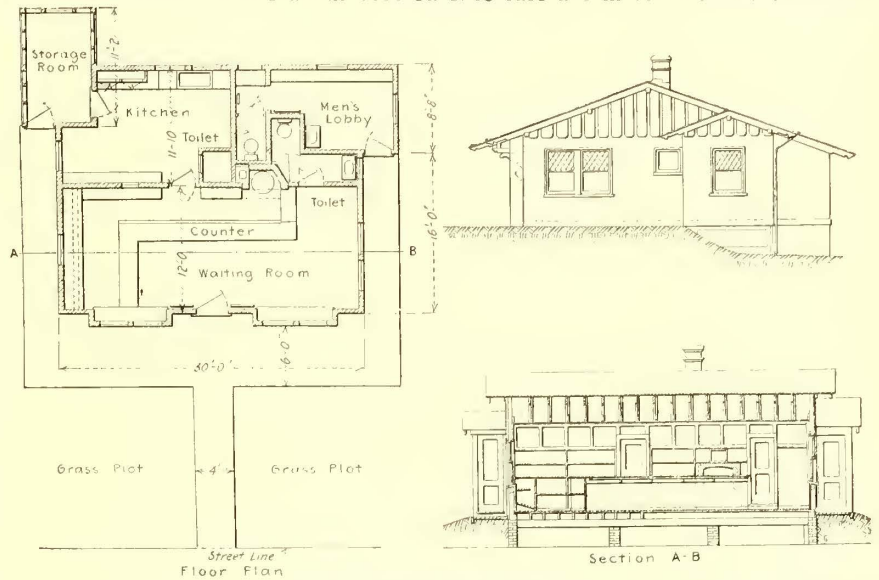
accommodations, with entrances and exits on each side of Washington Street. The middle portion of each platform is covered. The interior of the station provides for the separation of inward-bound and outward-bound passengers as well as the convenient exit to the street of passengers arriving on trains who desire to continue their journeys on the surface. The inside finish is of golden-grained oak. The platform lighting is accomplished at present by two rows of 16-cp lamps in the covered section, one being located about 9 ft. above the edge and arranged with the lamps spaced 6 ft. apart and the other at the rear of the roof and eighteen in number in a distance of 160 ft. About half of each platform is covered. The station lighting, with the usual heater circuits in the ticket offices, is controlled by sixty-four snap switches mounted on slate panels in a closet opening off the ticket lobby. Turnstiles are used at the entrances and exits. The exposed portions of the platform are lighted by pairs of 16-cp lamps mounted on the posts supporting the fencing, twenty-four lamps being required on each side of the station for this service.

The company's Dover Street station has been reconstructed within the past few months and changed from an island-type station to one with outside platforms. It is now capable of handling eight-car trains, as are all the other stations on the elevated lines.

POWER ADDITIONS, CAR CHANGES, ETC.

The company has recently added a third 15,000-kva turbo-alternator to the equipment of its South Boston generating station, as illustrated in the accompanying half-

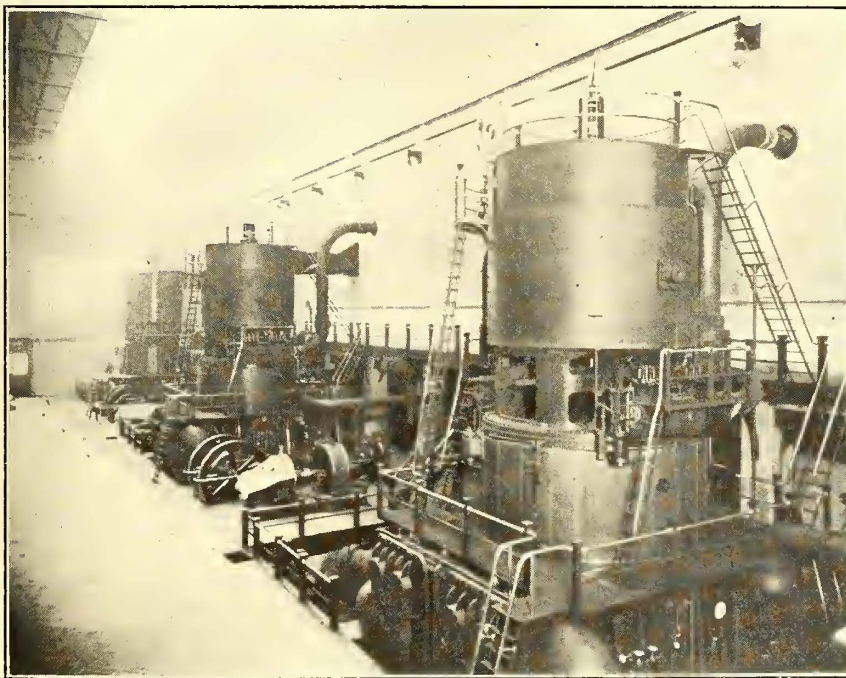
and their capacity is 23,000 kw, besides which they operate the engine-driven plants known as Central, Lincoln, Charlestown, Harvard and Dorchester stations in the supply of energy to the urban service. The total generating capacity of the system is now about 80,000 kw. In the rush hours about 1600 surface cars are in service and about 220



Boston Improvements—Details of a Waiting Room at West Roxbury in Hyde Park District

cars of the elevated type, including the Cambridge subway. The accompanying load curve shows the combined output of the company's generating stations on Dec. 9, 1912, when a peak load of 66,870 kw was carried between 5 and 6 p. m. This is the largest output the company's records contain for a similar period, and on this date the system carried 942,487 revenue passengers and probably 1,300,000 total passengers, including free bodily transfers which can be estimated only by traffic counts.

One of the most notable improvements on the system within the past two or three years is the increasing use of semi-convertible cars on lines where heavy traffic is carried long distances on schedules which to a considerable extent are in competition with the running time and service of the local steam railroads. The latest type of semi-convertible car used by the company seats fifty-two passengers, is propelled by a four-motor equipment and is of semi-steel construction, with an over-all length of 48 ft. 2½ in. It is operated on the prepayment plan, with folding steps and mechanically handled doors. There are nine cross seats, four longitudinal seats and an aisle 2 ft. 4 in. wide, providing ample accommodations for the longer-haul traffic. About 300 semi-convertible cars are now in service on the system, and their use has resulted in a noticeable reduction in running time between suburban points from 3 miles to 8 miles from the center of the city and the route terminals. The rolling stock of the company



Boston Improvements—Interior of South Boston Power Station

tone. This unit is a duplicate of the machines described in the issue of this journal of March 2, 1912, including its auxiliaries. No additional boilers had to be installed to meet the steam demands of the enlarged station, the existing plant being sufficient for this service. At present the company is operating seven rotary-converter substations

has been thoroughly described in previous issues, as well as the experiments which have been made along the line of articulated car design, the latter type having been illustrated in detail in the issue of Oct. 5, 1912.

In connection with the general improvement of the company's suburban service the accompanying halftone and

drawings illustrate a waiting station recently completed in the Hyde Park district, where car crews are changed in connection with service between Hyde Park and the Forest Hills elevated terminal. The building is of cement and stucco finish, with a wooden frame, and is provided with a lobby for car service employees and a waiting room and lunch counter, with a kitchen and storage room used by the lessee of the concession.

OPINION AND ORDER ON NEW YORK CAR STEP

An opinion in part as follows has been rendered by Commissioner John E. Eustis, of the Public Service Commission of the First District of New York, as the result of the inquiry conducted into the question of the height of car steps in Greater New York:

"The hearing in this matter was taken up originally on account of complaints received from some of the women's clubs in regard to the high step necessary in entering many of the surface cars. Mr. Connette, at that time chief engineer of transportation for the commission, testified that the height of the steps varied anywhere from 12 in. to 20 in. Some of the highest steps were on the P. A. Y. E. cars of the Metropolitan Street Railway, being about 19 in. to the first step. Mr. Connette suggested that the space between the ground and the body of the car, which height was fixed on many of the cars by the size of the trucks, should be divided into three steps—from 15 in. for the first step to about 11 in. or 11½ in. for the last step.

"Since the inquiry was begun I have examined the operation of folding steps in many cities and found they were very popular. Shortly after this investigation was closed in September, 1911, two of the companies interested in this question, the Brooklyn Rapid Transit Company and the New York Railways, designed and had constructed a new type of car called the stepless car and these they put into operation some months ago and they have been working very satisfactorily for both companies. The New York Railways also designed a double-deck stepless car and has had this in use for several months. As a result of these experiments the Brooklyn Rapid Transit Company has ordered 100 new stepless cars and the New York Railways has ordered 175 stepless cars. It would seem that the introduction of this number of stepless cars would within a short time help substantially to settle questions of the height of car steps.

"The only question that seems difficult of solution at the present time is what is best to be done with the old equipment now on hand. The Second Avenue Railroad appeared to have no cars where the first step was higher than 15 in., and on all but ten of its cars the first step is 14 in. or less from the ground. All the cars of the Third Avenue Railway and its allied lines in Manhattan and the Bronx have folding steps, and these steps are less than 15 in. in height. The New York Railways has reported that it has 1050 closed cars on which the first steps are 15 in. or less, and one lot of 155 closed cars on which the first step varies from 15¾ in. to 16½ in. in height, and the company has decided to reconstruct these last so as to bring the height of the steps to 15 in. or less by the coming summer. The Brooklyn Rapid Transit Company reported at first that it had about 1000 cars on which the first steps varied from 15¾ in. to 16¾ in. in height, but after its equipment department had made an examination of all its cars it reported that it found that these figures were taken before the cars were put into service and that the actual measurement of the height of the first step of all the present closed cars now in use was 15 in. or less except in the case of fifteen cars. It had also experimented on the cars in its shops as to the cost and manner of making the change to bring them down to the required height of 15 in. and reported the cost of doing this work to the

satisfaction of the electrical engineer of the commission at \$95 per car.

"The worst condition in regard to high steps was found in Queens Borough. The New York & Queens County Railway has fifty-nine cars in all, with steps varying from 16 in. to 16½ in. in height. The New York & Long Island Traction Company has twenty-two cars with the first steps varying from 16½ in. to 17½ in. The New York & Queens County Electric Railway has eighty-five cars on which the height of the first step varies from 15½ in. to 16½ in. The Long Island Electric Railway reported that all its cars had steps less than 15 in. in height. When the representatives of the companies in Queens which had cars with the first steps above the standard of 15 in. were asked if they could undertake to remodel the cars during the coming summer they expressed grave doubt, as they had no other equipment. They asked to be allowed at least two years to bring all of the equipment down to 15 in. or less. I think under the circumstances, operating as they do largely in country districts, the companies should have this request granted and should be required to reconstruct at least 50 per cent of their closed cars during the present year so that the height of the steps shall not be more than 15 in. It is more than likely that some of the cars that are reported as measuring 15½ in. for the first step may be found to be down to 15 in. or less as a result of the settling of the springs by constant use."

The commission issued an order which it concluded in part as follows, based on the recommendations made by the commissioner in his opinion:

"Ordered, that on or before Jan. 1, 1914, said New York & Queens County Railway, said New York & Long Island Traction Company and said Long Island Electric Railway shall so reconstruct at least 50 per cent of the closed cars to be operated by them that none of the car steps shall be over 15 in. in height, and that on or before Jan. 1, 1915, said last-mentioned companies shall so reconstruct the rest of said closed cars to be operated by them that none of the car steps shall be over 15 in. in height; and it is further

"Ordered, that on or before Jan. 1, 1914, said New York Railways, said Brooklyn Heights Railroad, said Brooklyn, Queens County & Suburban Railroad, said South Brooklyn Railway, said Nassau Electric Railroad and said Coney Island & Gravesend Railway shall so reconstruct the closed cars to be operated by them that none of the car steps shall be over 15 in. in height; and it is further

"Ordered, that this order shall take effect forthwith and shall remain in force until revoked or modified; and it is further

"Ordered, that within five days after service of a copy of this order upon them all of said companies above mentioned notify the commission whether this order is accepted and will be obeyed."

ELECTRIC RAILWAYS IN AUSTRIA

For the year ended Jan. 1, 1913, according to a report issued by the Elektrotechnische Verein, Vienna, Austria, had sixty-four electric railways, with a total length of line of 644.4 miles. There are nineteen standard-gage lines, totaling 365.4 miles, and 45 narrow-gage lines, totaling 279 miles. Three railways, totaling 44 miles, are operated with single phase and the remaining lines with direct current. Two of the latter use a trolley potential of 1000 volts or more.

The Maysville (Ky.) Street Railway has installed bath and toilet fixtures in its new carhouse for the use of its motormen and conductors. The bathroom is finished in tile and marble and is equipped with shower and tub baths, washstand, etc. An automatic hot-water heater is part of the equipment.

Hamburg Subway and Elevated Railway

A Description of the Route and the Character of Construction Adopted for the Way and Stations

The ELECTRIC RAILWAY JOURNAL for Oct. 30, 1910, contained a preliminary description of the Hamburg Subway & Elevated Railway, which was then under construction. The following article is the first of several which will describe the way construction, maintenance methods, power generation and transmission, rolling stock and traffic features of this system.

HISTORY OF THE PROJECT

As early as 1893 a rapid transit system was suggested for Hamburg. It was proposed that this should assume the form of a belt line around the Alster Lakes and that it should also be a part of the Prussian State Railroads System. This plan would have been in imitation of the Berlin

graph, will come into the possession of the State of Hamburg when the franchise expires.

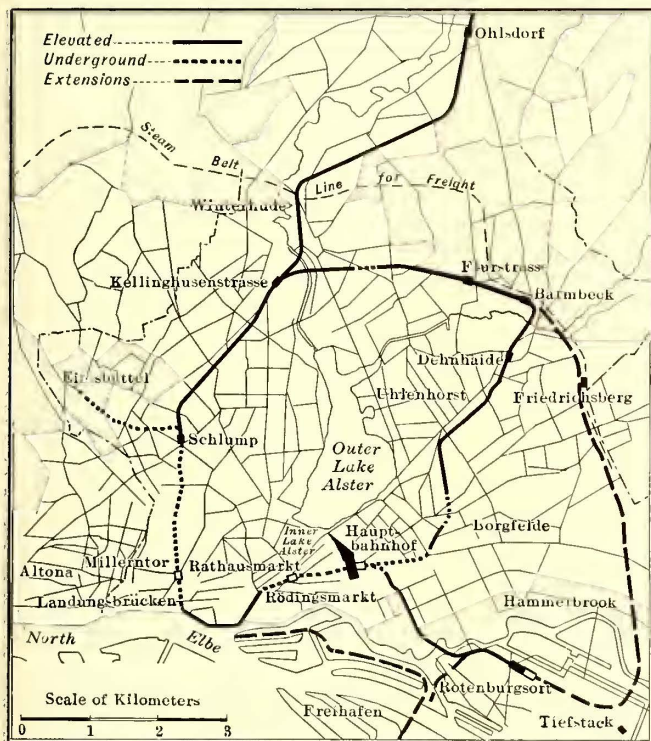
The franchise provides that the State of Hamburg shall receive the following proportions of the gross earnings:



Hamburg Way—Ornamental Entrance to Hauptbahnhof Station

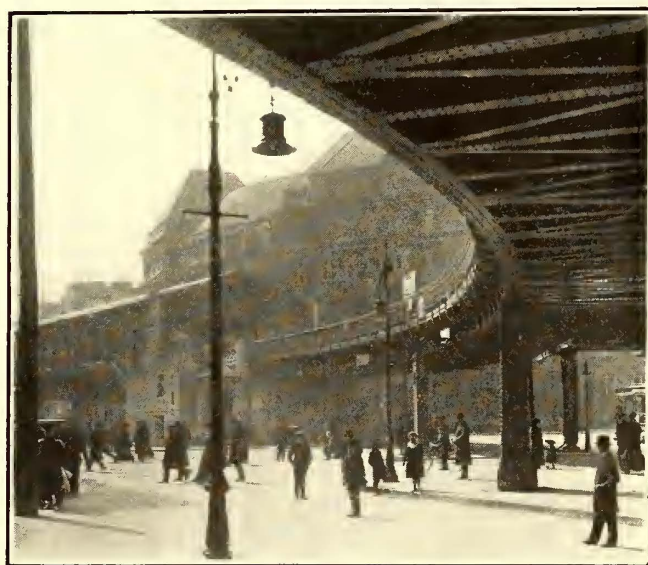
1 pfennig from the sale of 10-pf. tickets, 3 pf. from 15-pf. tickets, 6 pf. from 20-pf. tickets, 9 pf. from 30-pf. tickets and 10 per cent from all season tickets. In addition to these proportions from gross earnings, the State is to receive one-third of the surplus which remains after a dividend of 5 per cent has been paid to the stockholders. At the end of the forty-year franchise all fixed property, hence exclusive of rolling stock, becomes the property of the State.

In order to carry out the provisions relating to the con-



Hamburg Way—Present and Proposed Lines of the Hamburg Rapid Transit System

Ringbahn. Even at this early date, however, it was pointed out that a steam road of strictly belt-line character would not give such good rapid transit as an electric railway which could pass under or along the streets of the city. In 1908 the Prussian State Railroads completed the well-known Hamburg-Blankenese-Ohlsdorf high-speed suburban line on the single-phase system, a road which is now carrying about 65,000,000 passengers a year. In the meantime, the State of Hamburg had determined to have an independent electrically operated system. To this end it made a construction contract in 1906 with the Siemens & Halske company and the Allgemeine company, acting as one corporation, whereby they were to build for the sum of 42,300,000 marks (approximately \$10,300,000) the belt line and the three earliest extensions hereinafter detailed. The operating franchise granted under a later and separate contract to the same joint company is for a period of forty years. Under this second agreement the contractor organized a company with a capital stock of 15,000,000 marks (\$3,675,000) to supply the operating equipment, the stationary parts of which, as noted in the following para-

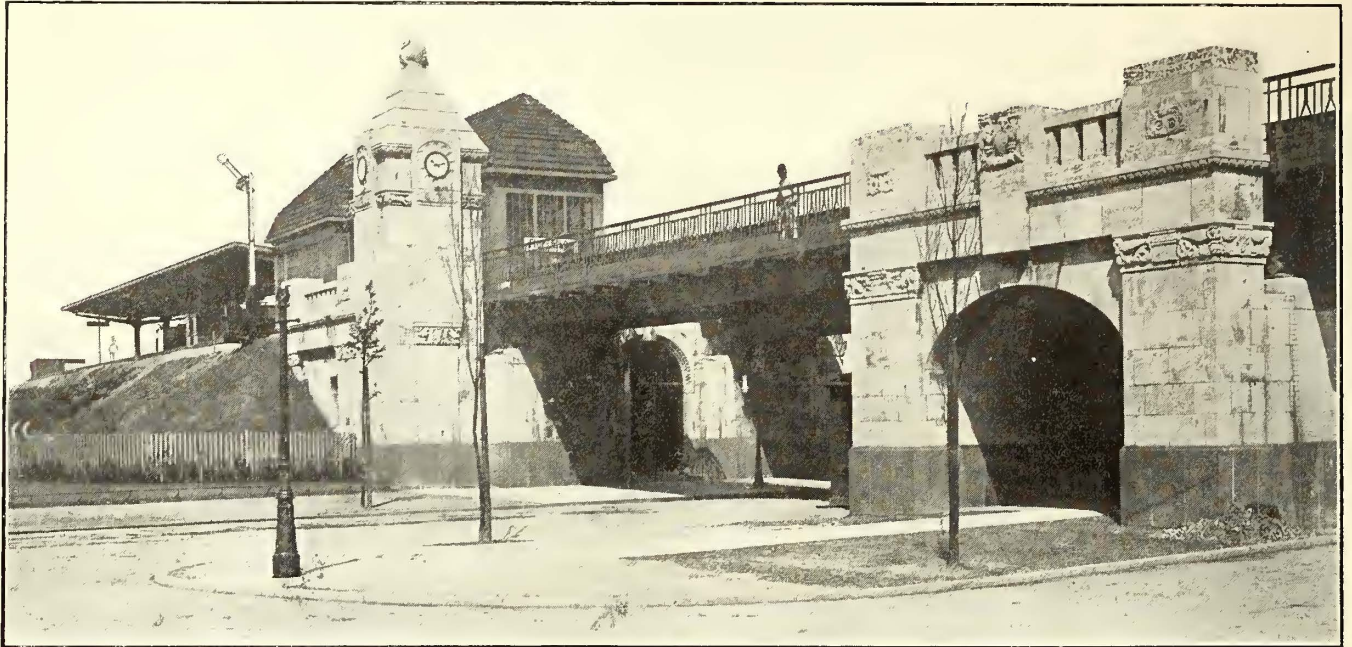


Hamburg Way—Curve at Rödingsmarkt Station

struction contract, a joint "Bauverwaltung" (construction management) was formed under W. Stein, now general manager Hamburg Subway & Elevated System. The several parts of the operating equipment were furnished as

follows: power stations, feeder cables and collector rails, Allgemeine company; two substations, shops, safety devices, telephones and clock systems, Siemens & Halske company; rolling stock, both companies. The preliminary arrangements for these installations, the inspection of con-

This wonderful acceleration in growth could no longer be mastered by the combined facilities of the street railway system, which carries some 200,000,000 passengers a year, and the boat service on Lake Alster. The only solution lay in the inauguration of non-surface rapid transit.



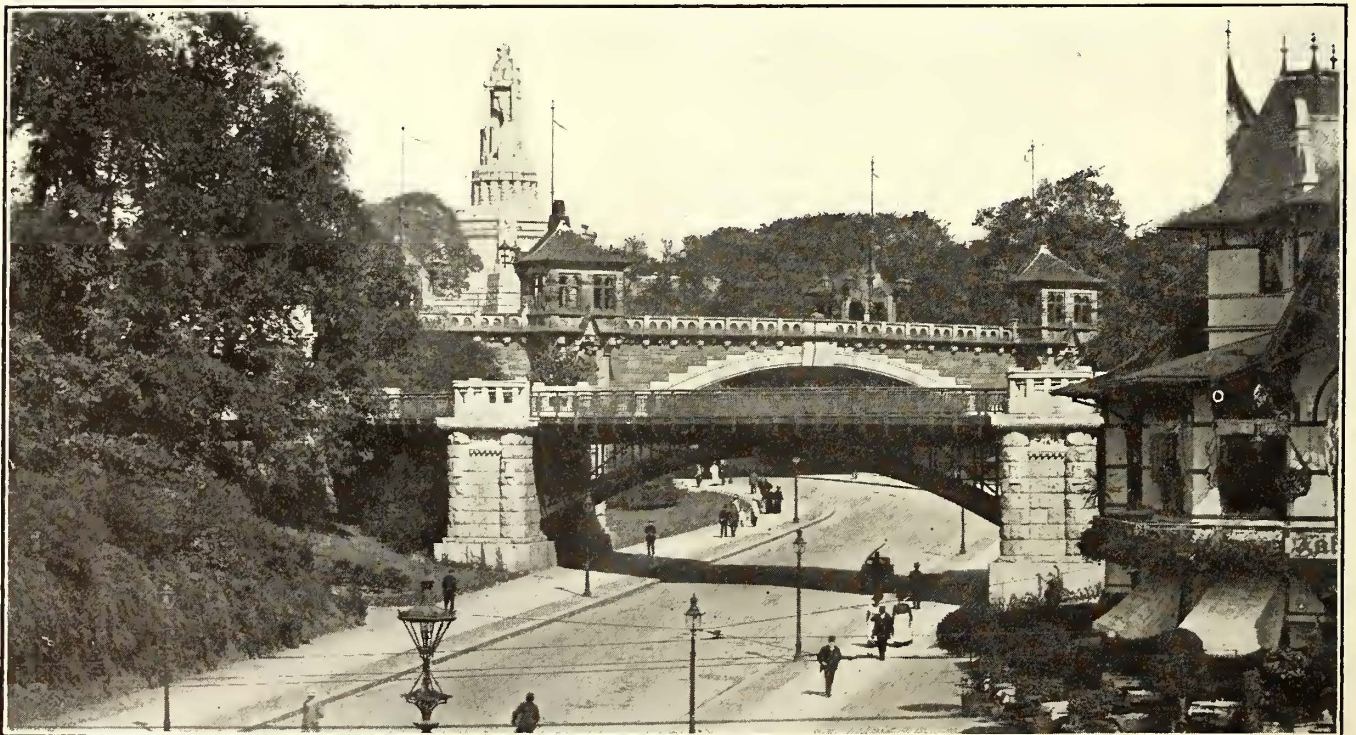
Hamburg Way—Station at Flurstrasse, Showing Street Crossing Treated as a Gateway to a Public Park

struction and the opening and operation of service were in the hands of the Bauverwaltung under the charge of Wilhelm Mattersdorff, now director of operation Hamburg Subway & Elevated System.

CHARACTER OF THE SYSTEM

Although Hamburg has long been a world-famous city

As shown in the accompanying map, the completed system will consist of the main line around Lake Alster, 10.85 miles long, and three branch lines totaling another 7.5 miles. The service on that portion of the main line between Rathausmarkt and Barmbeck, a distance of 4.03 miles, began March 1, 1913, with a total travel of 30,000.



Hamburg Way—Crossing of Elevated Structure in a Public Park Near the Great Bismarck Monument

because of its leading position as a port, its great reputation was out of proportion to its size until very recent times. In 1870 the population of Hamburg was only 285,000, in 1890 569,000, while to-day it is practically 1,000,000.

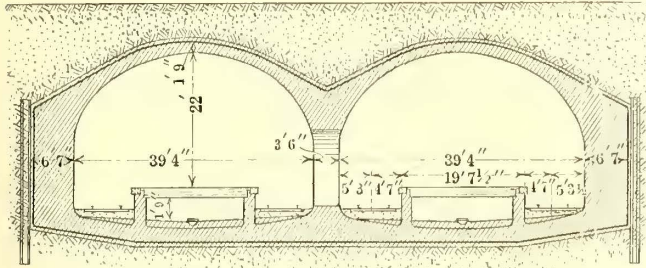
During the following May the ring was continued to Millerntor, which increased the daily travel to 45,000. On June 29, 1912, the last three stations through the "port" and remaining business section were closed, with the result

that the daily traffic rose immediately to 90,000. Of the three branches, the one from Kellinghusenstrasse to Ohlsdorf, 3.1 miles long, and that from Schlump to Eimsbüttel, 1.6 miles long, are under construction and are planned for operation in 1914. The line from Hauptbahnhof (main

It is anticipated that for some years to come the capacity of the main line will be ample to permit the operation of through trains to the terminals of the branch lines, but it is believed that in years to come these branches will have to be treated either as shuttle lines or extended into Hamburg as independent systems. As a matter of fact, the State of Hamburg has already approved the early construction of a branch from Barmbeck to run northeast for a distance of 17.5 miles. An extension of the Ohlsdorf line is also planned as well as a connection with the southern bank of the Elbe River.

STATION SPACING AND WAY FEATURES

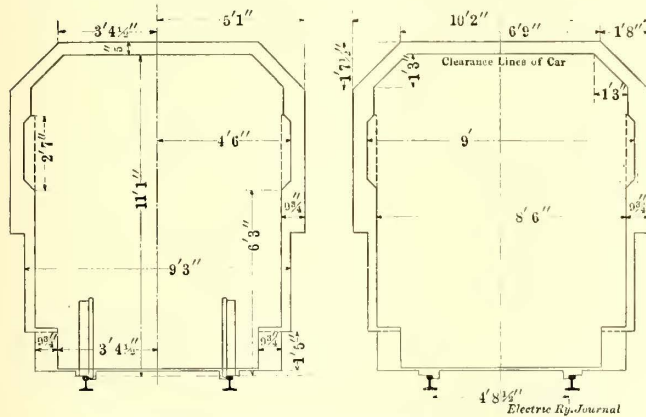
The main line has twenty-three stations spaced at an average of 2500 ft. The ten stations on the branches are somewhat farther apart, making the average spacing on the entire system 2700 ft. The right-of-way is double-tracked throughout except that one or two additional tracks are provided at junctions with branches, at turnback points and the like. Although part of the line is underground and part elevated, the change from one to the other is



Hamburg Way—Cross-Section of Arch-Roof Section

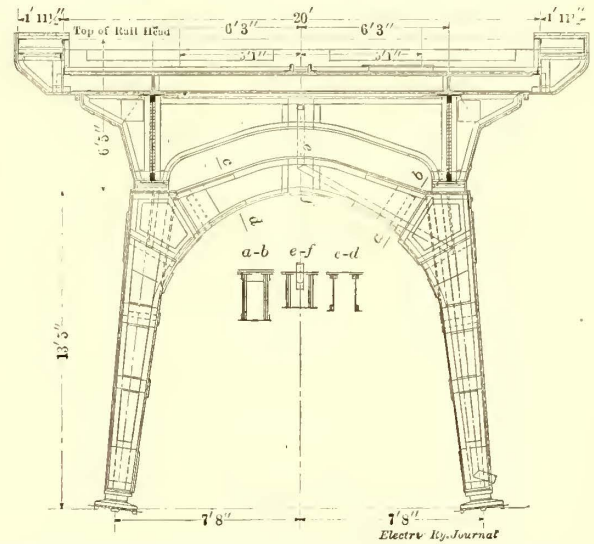
railway station) in Hamburg to Rotenburgsort, 2 miles, is to be started later.

Despite its belt-line form on the map, the main line of the Hamburg system should not be confused with the belt railways of cities like Berlin and London, which have the



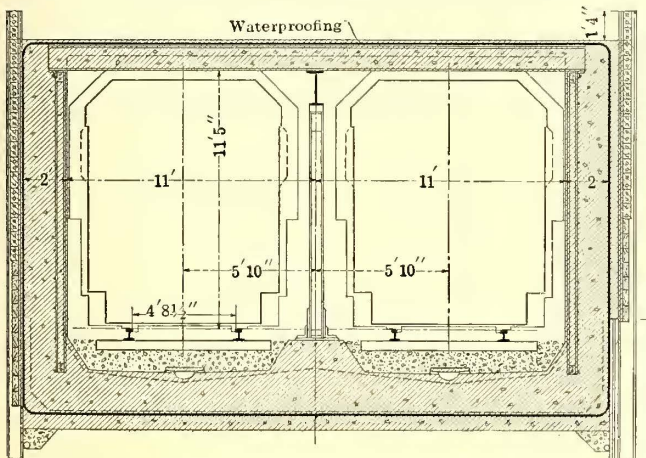
Hamburg Way—Car Clearance Profiles

double defect of wasteful car mileage to the operator and loss of time to most of the passengers. The main line of the Hamburg system really consists of two radial lines passing from the business section to the northern residential district along opposite shores of Lake Alster, but over which a belt line service is made possible by a cross

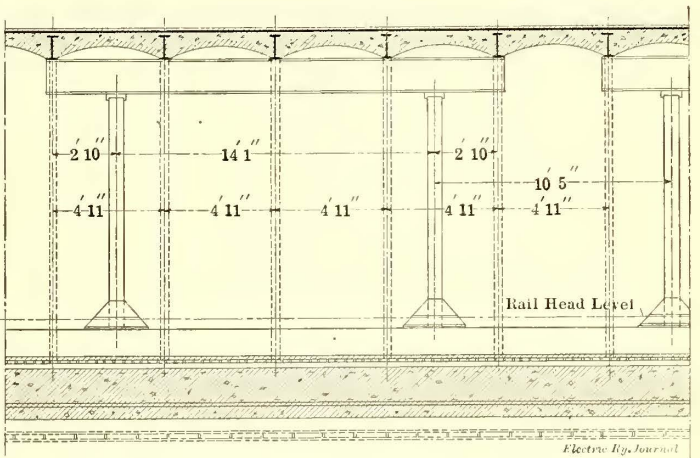


Hamburg Way—Typical Rocker Bent Construction

made on easy grades with the exception of the portion between Rathausmarkt and Rödingsmarkt stations, where a maximum grade of 4.9 per cent and a curve of 233 ft. radius are encountered on a piece of track about 600 ft. long. The principal physical data of the main line and branches follow:



Hamburg Way—Cross and Longitudinal Sections, Showing



Construction of Subway in Districts with Ground Water

connection 2.17 miles long, through a newly developed part of the city. In arranging a five-minute service, therefore, one-half of the trains run only between Kellinghusenstrasse and Barmbeck within the well-settled districts, leaving a ten-minute interval between the belt-line trains.

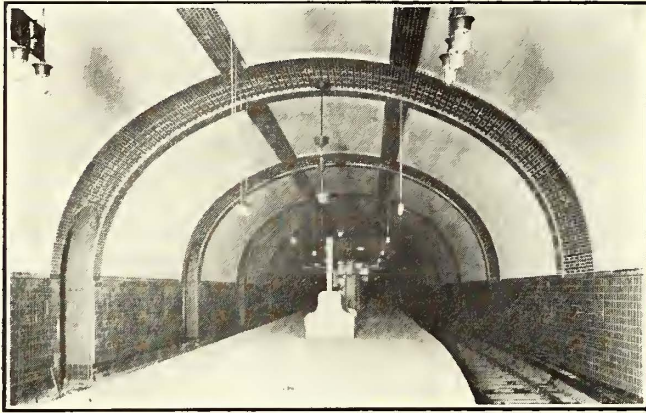
Gage	4 ft. 8½ in.
Arch-roof tunnels	1,378 ft.
Flat-roof tunnels	24,020 ft.
Stone viaducts	5,215 ft.
Steel viaducts	13,482 ft.
Undercrossings (forty-three)	4,789 ft.
Bridges (fifteen)	2,414 ft.
Retaining walls and fills	37,162 ft.

Retaining walls and open cuts.....	5,248 ft.
Curves of minimum radius	233 ft.
Maximum grade	4.9 per cent
Width of streets carrying the elevated structure.....	.98 ft. to 180 ft.

The clearance profiles which are shown in an accompanying drawing are about 12 in. wider and 6 in. higher than that of the Berlin subway. Another drawing shows one of the yoke-form rocker ("pendel") bents used for part

STATION DECORATIONS

The interior and exterior treatment of all stations, whether on the subway or elevated sections, is of highly artistic character. Perhaps the most costly decoration is that of the interior at Rathausmarkt, reproduced in an accompanying illustration, where the walls have been covered with panels of green and yellow marble surmounted



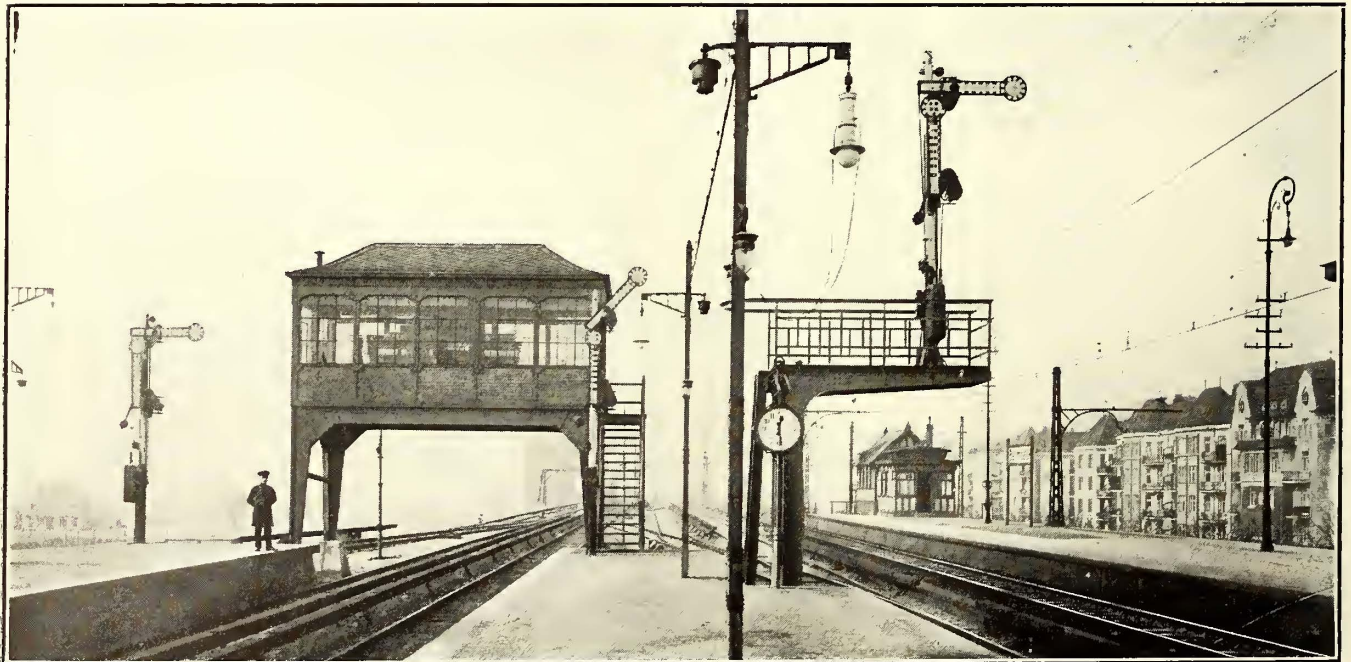
Hamburg Way—Arch with Niches at Hauptbahnhof Station



Hamburg Way—Ticket Office at Rathausmarkt Station

of the steel viaducts. A third drawing presents sections of the flat-roof underground construction. The latter work, as illustrated in one of the halftones, consists of steel beams framed into both the concrete walls and roof, a row of steel columns between the tracks and a concrete floor for the rock ballast. Arches are used only where some extraordinary weight must be supported, as in the construction near the main steam railway station illustrated. All platforms are of reinforced concrete. The stations on the eastern division between Landungsbrücken and Dehnhäide have double outside platforms, but those in the less developed sections have single island platforms. However,

by ornamental plaques and other decorations of majolica ware made at the noted potteries of the German Emperor. The view of this station shows three ticket offices at the right and two booths at the platform entrance and exit aisles where the passengers' tickets are punched or taken up as the case may be. Another interior of somewhat different type is that of the island platform at the Hauptbahnhof station, where wall niches have been provided in harmonious continuation of the bands of tiling which extend along the arches. A beautiful stone and metal stairway to this station is presented in another illustration. All street crossings were designed with the view of being as



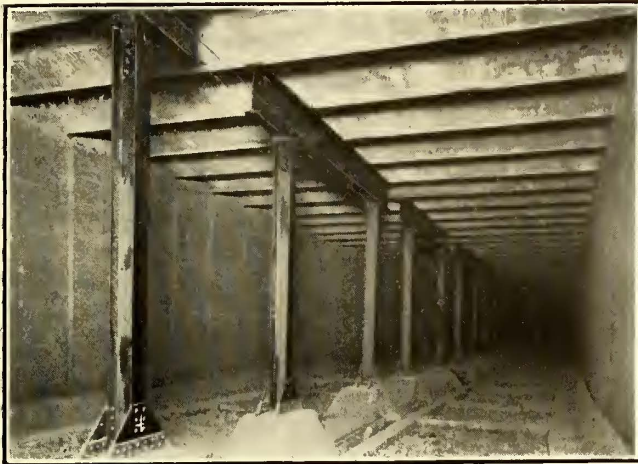
Hamburg Way—Platform, Track and Signal Layout at Barmbeck

the Hauptbahnhof (main steam railroad) station has four tracks with two island stations and walkways connecting to the tracks of the Prussian State Railways overhead. Near this point also the tunnel was enlarged to receive a substation. The rails are of the Haarman type, weighing 60 lb. per yard, and are laid on creosoted ties and rock ballast at intervals of about 2 ft.

handsome as the conditions permitted, but the viaduct over Flurstrasse, shown on page 416, was made particularly impressive in order to have it serve as a gateway to a new public park. Still another view shows how well the elevated structure has been made to enhance rather than to detract from the beauty of the park section adjacent to the great Bismarck monument. A feature which con-

tributes to maintaining the neat appearance of all stations is the use of washable enameled shields for all station names, warning notices and the like.

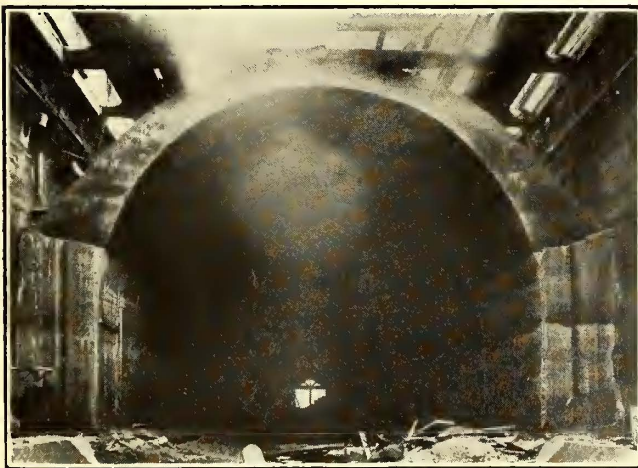
An illustration on page 418 shows part of the station at Barmbeck where four tracks have been installed. The track layout at this station was of prime importance as it is here that one-half of the trains are turned back to the



Hamburg Way—Steel and Concrete Flat-Roof Section

city and also where cars are switched to the carhouse and shops. The inner tracks are continued partly to switch trains back to the city and partly to give a two-track route to the carhouse and shops. At the right of this illustration will be noted the catenary construction of the Hamburg-Blankenese-Ohlsdorf single-phase railway. The same illustration also shows some semaphores of the Hamburg semi-automatic signal system.

The general construction of this signal system is the same as that used on all steam lines of the Prussian State Railways. The principle is semi-automatic. Within one block section only one train is permitted so that only one signal can be moved if the train has passed a rail contact behind the following signal. For the purpose of adapting this system to high-speed railways and very dense traffic, the Siemens & Halske company made the apparatus semi-automatic. All that the authorized station operator



Hamburg Way—Arched Subway Entrance

does is to push a button, whereupon he can leave the apparatus because the other movements are perfectly automatic. These operations do not require more time than a standard automatic system, while they embody the additional advantage that the signals are under the permanent control of specially instructed platform men. No track trips are used for stopping trains.

OPERATING METHODS OF THE BUREAU OF SAFETY OF THE MIDDLE WEST UTILITIES COMPANY

In an item published in the *ELECTRIC RAILWAY JOURNAL* of March 1, 1913, brief mention was made regarding the plans and purposes of the bureau of safety which has been organized by the Middle West Utilities Company to act in an advisory capacity relative to its various subsidiaries. The work of this bureau is described in the following paragraphs:

Previous to the organization of the safety bureau the Middle West Utilities Company decided to handle its own fire and liability insurance under a trust agreement. Liability and fire insurance agreements have been entered into between the trustees and the subsidiary companies, and for the present the assessments against each are approximately the same as the premiums paid to independent companies handling the same classes of insurance. The trustees of this fund are Samuel Insull, president of the Middle West Utilities Company; Martin J. Insull, vice-president, and Edward P. Russell, one of the directors of the company.

The bureau of safety is independent of the Middle West Utilities Company and merely acts as a corps of experts in an advisory capacity to the different properties. Its purpose is to reduce as much as possible fire hazard and recommend safer operating methods, as well as safety appliances, in each of the plants. In other words, it acts as a board of insurance underwriters, the business of which is to conserve the insurance field. The trust fund accumulating from assessments will be deposited at interest, and as the fund grows the interest will be paid to the different subsidiaries in proportion to their assessments, or the assessments will be reduced from time to time so that the amount of money on hand in the trust will be only sufficient to carry the insurance. The trustees will issue participating certificates in lieu of a policy.

At the present time complete sets of forms and instructions have been issued by the bureau. One on fire hazards and fire protection states in detail the causes of fire, both physical and electrical, and contains a list of ordinary precautions to prevent the starting of fires. It also calls attention to precautions to take against the spreading of fires due to exterior or interior exposures and in conclusion states: "In making suggestions for the reduction of fire hazard, it has not been the intention to suggest any radical changes in building and equipment, because it is believed that in general such changes are unnecessary."

The reports include five different forms, one a monthly report on the condition of the property as regards fire hazard, three on different classes of accidents and a surgeon's report. The purpose of the monthly report of the foreman of the property is to keep the bureau advised as to the precautions being taken to reduce fire hazard, and at the same time it will have a moral effect on the foreman of each property in that he will not care repeatedly to report fire hazards for which precautions could be taken.

The three accident reports include one to supply the bureau with information relative to the cause of accidents to persons other than employees caused by operation of a property other than a railway; another, a report of an accident to an employee which will identify the employee injured as well as advise the bureau of the seriousness of his injury, and a third report for use in case of injury growing out of the operation of a railway, giving information as to the identity of the person injured and the description of the accident and names of witnesses.

The bureau of safety is in charge of Charles B. Scott, manager. Alexander Shane is in charge of the railway safety department, and another safety expert will have charge of a corps of inspectors familiar with lighting plant operation. The third department will include a number of inspectors whose business it will be to make recommendations with a view to reducing fire hazard in all plants.

Meeting of the New York Electric Railway Association

An Account of the Proceedings at the Quarterly Meeting Held at Lake George, N. Y., March 6-7—Abstracts Are Presented of Papers on Power Distribution, Trailer Operation, Interurban Railways vs. City Railway, and the Claim Agent's Work—The Discussions of the Question Box and an Account of the Informal Dinner, as Telegraphed, Are Also Included.

THE SUCCESSFUL CLAIM AGENT

BY W. H. HYLAND, CLAIM AGENT FONDA, JOHNSTOWN & GLOVERSVILLE RAILROAD COMPANY

The chief duties of the claim agent in days gone by were to secure a release from the injured as quickly and as cheaply as possible. The slogan in the claim department was "Get the release no matter how."

To-day all agree that this practice was not only at fault for the loss to the railroad company of the public's good will but it also made the name "claim agent" a thing to be winked at. The claim agent to-day must not only satisfy his employer but he must likewise satisfy that portion of the public with whom he is brought in contact.

QUALIFICATIONS OF THE SUCCESSFUL CLAIM AGENT

If I were asked what qualities were most essential to the successful adjustment of damage claims, I should say, arranging them in the order of their importance, courage, kindness, confidence, earnestness, patience and tact, and to these qualities I would add a pleasing personality.

I know there are many who will take exception to the great number of essentials required of the successful claim agent, but who can deny that it does not require courage to enter the home of one who has been fatally injured in a collision on your road and around whose bed the weeping family is gathered? This is a situation which every claim agent must meet some time during his career and is one that will not only test his talents but will bring the thought home to him that it requires courage to be full of faith when things look dark and unsurmountable.

The successful claim agent should be kind because it is not only a mark of wisdom but all the world needs it. He should have confidence in himself, in his employer and in his proposition. He cannot hope to inspire confidence in others if he does not possess it himself. In matters pertaining to business he should be earnest, but earnestness should not be confounded with seriousness. A man may smile or even laugh and still be earnest; but he must be ardent in spirit and speech. It is this quality that gives to everything he says a convincing ring. He should be patient and tactful, always aggressive, yet biding his time in which to do the best work and get the best results. He should have a pleasing personality, that indefinable something that makes the presence of one person welcome and the presence of another unwelcome. He should have a knowledge of negligence law sufficient in case of accident to decide at once whether or not there is any liability on the part of his company.

WORK OF THE CLAIM AGENT

Now that we have enumerated all the qualifications apparently necessary for the success of the claim agent, let us proceed to discuss the actual work for which he is prepared.

The successful claim agent will never be absent from his office without leaving word where he can be located. He will traverse the property of his company frequently. He will keep a close watch on all highway crossings and observe if buildings or other structures which would in any way prevent a clear view of approaching cars are being erected near such crossings. He will observe if crossovers have been placed near sharp or dangerous

curves, and he will bring these and all other like matters which have a bearing upon accidents to the attention of his superior officer, having in mind that nothing is so easy as to be wise after an occurrence. I do not wish to maintain that the claim agent is the only man connected with a railroad corporation that observes conditions, but from the very nature of his work and training he will observe conditions that a busy man in the operating department might fail to observe. He will be familiar with the timetables, the operations of trains and understand the rules which govern them. He will attend all smokers and entertainments given for the enjoyment of men in the train service, for there he will become acquainted with the men and have excellent opportunity in the practice of that mutual respect which is one of the essential conditions of a good organization.

When serious accidents occur, like derailments and collisions, wherein several passengers have been injured, the claim agent should be called with the wrecking crew. Upon reaching the scene of the accident, he will take charge of his portion of the work, which consists of securing conveyances and doctors and assisting passengers in general to reach their respective destinations. In this he will spare no expense for courtesies extended by railroad companies at such a time are not only appreciated but are scarcely ever forgotten by the traveling public. It is usually possible at this time to take the release of passengers for minor injuries and damaged wearing apparel, but under no circumstances will the claim agent at this time attempt to settle claims where serious injury has been sustained. The more serious cases should, if possible, be sent to a hospital. Doctors will usually assist the claim agent in this respect for the reason that the patient receives better care at the hospital and it is a more convenient place for the physician to attend the patient. The claim agent desires the patient to be sent to a hospital for two reasons: first, it is possible for him to keep in touch with the patient at all times, and second, the discipline of the hospital will keep out that class of curious people who know just how much money the injured person should receive and who are sure to offer their advice in the matter. If any are fatally injured, he will call the ambulance and on their death will notify the coroner, and also the relatives of the deceased, telling them where the body may be found, ascertaining as soon as possible the name of the undertaker employed, and where it is the policy of his company to pay funeral expenses whether there is liability or not on its part, he will request the undertaker so to notify the relatives.

The policy of a railroad company to pay funeral expenses in all cases is a good one, I believe. It makes it easier for the claim agent to get in communication with the relatives of the deceased soon after the funeral, and where there is no liability on the part of the company a release can usually be secured by the payment of the funeral expenses. It is also wise, from another viewpoint, to pay funeral expenses. Where a release cannot be secured and a complaint is served in an action, the railroad company in its answer to such complaint can set up as a partial defence the payment of funeral expenses. This allows the attorney for the railroad company the opportunity, in summing up the case before the jury, to mention the fact that although the railroad company was not at fault for the

accident, yet it did pay the funeral expenses and it therefore had done its full duty to the relatives. On the other hand, if the company has not paid the funeral expenses and a question of fact is developed during the progress of the trial, the jury, regardless of whether or not the company is to blame, will give the relatives some substantial verdict.

Unfortunately the claim agent can have no code of rules or fixed lines to guide him in his work of adjusting claims. It is like whipping a child who has disobeyed. If you strike the child one blow too many or too little, you have done injury and your effort to do good is lost. So it is in the adjustment of claims; to pay too much or too little is to lose that good which should follow the adjustment of all claims. The successful claim agent strives in each and every case to drive a fair, square bargain, always taking into consideration the seriousness of the injury, pain, suffering and probable loss of time, and always allowing something for the inconvenience caused the family.

After having secured the release, the successful claim agent will not grab his hat and hurry out of the house, but he will remain for a few moments, engage the family in conversation and make them feel that the relations established between them and his company are not at an end but that they shall continue. If the claim agent will do this, the money spent in adjusting such claim will have been well spent and will bear much fruit.

The successful claim agent above all things must be truthful in fact and his conduct toward that portion of the public with whom he comes in contact should be such that his reputation for truthfulness is maintained. He should not lose sight of the fact that a great portion of the public are daily riders upon the cars of his company and that they want to know not only the policy of his company but also the whys and wherefores.

The successful claim agent, therefore, should have a fair knowledge of the workings of the different departments and be prepared to answer intelligently the hundred and one questions that he is sure to be asked by the public during his travels about a city.

Finally, the successful claim agent is a man who has the confidence and respect of his company's attorneys. Their office door, where he may enter and receive advice and consolation, is always open to him. In many respects he is like a tree which results from good seed planted in good ground. The tree must be well cared for, and if it is to bear more fruit year after year, it must be trimmed now and then, but never with an axe.

SOME POWER DISTRIBUTION PROBLEMS

BY H. J. CHILDS, ENGINEER POWER DISTRIBUTION UNITED TRACTION COMPANY

The particular power distribution problems that I propose to discuss are some that have been met with on the United Traction Company system recently, and I will endeavor to show how solutions of these problems were found.

The feeder system of Albany previous to rearrangement was carried overhead on a pole line running through the principal streets and connecting the two sources of power, a modern rotary converter station and a small auxiliary d. c. steam station, situated at opposite ends of the city. The city was divided into ten sections, fed from branch feeders run out from the main feeder lines.

REDISTRIBUTION OF CITY FEEDERS

An ordinance passed by the city required the placing of the feeders underground within a restricted district, with the exception of one cable on each street occupied by a car line. This district was in the business center of the city, and it was so located relative to the rotary converter station from which power is normally taken that a part of the feeders for all the sections had to be run around overhead or placed underground.

The first plan, to run all feeders overhead around the restricted district, was found objectionable, and laying the conduit lines over the same route as the pole lines required the running of one conduit line through a network of pipes at so many points that it was also abandoned. In the plans as finally carried out the main conduit line was run through near the edge of the restricted district on one side, and this district was partly fed by means of the one overhead feeder allowed, the rest of the supply being furnished by means of a conduit line through the main street. Taps were taken direct from the underground cable and carried up inside the tubular steel poles, and by means of a porcelain pothead, which also serves as a cut-out, to the feeder span. This plan gave the shortest route to the heavy load points and also the advantage of having the main feeder above and near the heavy load center, so that outlying points were not so much affected by the heavy load point drop.

The problem in laying the conduit line consisted in finding sufficient unoccupied space to construct the duct line and manholes. Our map was made up from the most reliable sources of information, but it did not show all that was found when the trench was opened; for instance, very few house drains could be located without digging for them. A series of test holes the width of the trench, and just long enough to give working space, was dug about 150 ft. apart over a route that appeared from the map to be open, and from these the route for the line was laid out. It was found necessary to shelve manholes in some cases to get any headroom. On one street it was necessary to shift the tracks to get space enough to lay the conduit line, but as this track was being relaid the additional expense was not very great.

The size of the cables was determined by a series of readings taken at the rotary converter station, about 650 amp maximum being allowed per 1,000,000 circ. mil. Allowance was made for growth, the limit for this being the limit of the pocketbook.

As larger and more cars were added and routes changed it was necessary to rearrange the sections and to divide the load according to the size of the feeders in the main line from the rotary converter station to the beginning of the conduit, which was not reinforced, and also to bring the feeders of the outlying sections to the nearest point of the heavy load on that section. The overhead feeders that were taken down were used in rearranging outlying sections.

The necessity of having all feeders of a section connected together where a section is fed from two different points was shown when by running 2000 ft. of overhead cable and connecting together two feeders of a section fed in this manner 1.4 volts per 100 amp decrease in drop was obtained at one point and 2.9 volts per 100 amp at the outlying end of the section. Another section that was fed from both ends showed a decrease of 3.6 volts drop per 100 amp of load after connecting the ends together. These values were obtained after the main feeders were connected through the conduit, and show only the increase due to connecting the feeders together.

In adjusting the load on different sections by changing the location of section insulators, we had to consider the liability of tying up all car lines that run for a short distance on the same section due to failure of power on one section. At one point three different car lines travel for several blocks over the same tracks, and it was necessary to feed this territory from a section that fed a line running to the city limits, a distance of several miles from the emergency station. As the feeder for another section runs through this territory, the feeder taps were connected to both sections by means of knife switches, and the section insulators bridged with No. 0000 wire connected through a knife switch, so as to provide a means of feeding from the neighboring section in case of a failure to the section on which it is normally carried.

LAYING A SUBMARINE CABLE

The Rensselaer section on the opposite side of the Hudson River was fed over a drawbridge, submarine cables being laid around the draw only. This bridge is located at the opposite end of the city from the rotary converter station. In order to get a direct route to feed this section, it was necessary to lay submarine cables all the way across the river at a point about $1\frac{1}{2}$ miles nearer the rotary converter station. In order to lay cables in navigable waterways it is necessary to obtain permission from the United States government. The first permit obtained called for a minimum depth of 20 ft. below mean low water between bulkhead lines, but this was finally reduced to 18 ft. As the depth of water at this crossing varies from 2 ft. to 12 ft., it was necessary to dig a trench by means of a dredge.

The hardest problem in dredging is the disposal of material at a low cost. As the only available dumping place was 45 miles down the river and about 7000 cu. yd. of material had to be disposed of, permission was obtained from the government to dump the material back in the trench. In order to do this the trench was dug for a distance of about 100 ft. to give the dredge space to turn around in. Then the reels of cables were set up on a small scow attached to the side of the dredge. Upon this the ends of the cable were drawn up on the bank to a terminal pole of the overhead feeder line to which they were to be connected, and the cables were dropped in the trench which had been dug. The dredge then proceeded to dig out the trench ahead, and the cables fed out as the dredge advanced, the material dredged being dumped in a bottom-dumping scow, and when filled towed back over the trench and held with anchors until dumped in the trench on the cables.

It was necessary to have the cables on a separate scow so as to make them independent of the movements of the dredge. This proved to be a wise plan, as the trench ran into a sand bank and it was found the dredge could not make and hold the 18-ft. depth required, so it was necessary to go over the trench the second time, the cable scow being cut loose and anchored for the first cut. By the plan of dumping back in the trench it was found necessary to make only two tows, instead of about twelve which would have been otherwise required. As these tows cost \$100 each, quite a saving was effected.

After the cables were laid in the trench between the bulkhead lines, the ends on the Rensselaer side were carried up on the bank and buried in a trench, a covering of boards being placed over them and the cable ends carried into a manhole. In this manhole they were connected to the underground cables running under steam railroad tracks. This underground construction was decided on because the requirements of the steam railroad company for an overhead crossing were so exceedingly strict.

ELIMINATING POLES, MAINTENANCE PROBLEMS, ETC.

In replacing a pole line on the principal street on account of a "city beautiful" movement, it was planned to do away with poles so far as possible by obtaining permission to attach the span wire to an eye-bolt in the buildings suitable for the purpose. This plan met with the approval of all but two of the building owners, and in several instances we actually were asked to attach wire to buildings which we did not consider safe for this purpose. As the new poles were tubular steel and not as heavy as the lattice poles which were holding a long curve at one point, the tubular steel poles were reinforced by filling them with a 1-2-5 mixture of concrete and old tie rods, the concrete being mixed soft and carefully tamped in the pole.

In solving the problems of trolley wearing at the ears we are trying out a scheme of using a 9-in. ear first, then replacing it when worn by a 12-in. ear and substituting for this a 15-in. ear in turn. As this plan has been in force only about seven months no definite data of saving can be shown as yet.

Plans have been started further to improve the system

by moving the rotary converter station to a point near the load center and so doing away with the losses in 6500 ft. of the feeder system.

When the underground ordinance was passed it was considered a burden, but subsequent developments show that it has been a great benefit. The entire distribution system has been dressed up, while the better voltages obtained enable more and better-lighted cars to be run and kept on schedule, thus eliminating much complaint.

OPERATION OF TRAILERS IN CONNECTION WITH PEAK LOAD CITY SERVICE

BY GEORGE L. RADCLIFFE, GENERAL MANAGER THE CLEVELAND RAILWAY

The operation of trail cars is not a new experience for us in Cleveland. Nor, do I imagine, is it new to many of you who are here to-day. I wish only briefly to point out the changes made in equipment since the trail car last was in general use.

With adequate motors and improved tracks, its operation is no longer hazardous; its application to traffic problems is definite and easy. No more a makeshift but specially designed to meet certain conditions, it is in every way a worthy running mate for the modern motor car. The first modern trailer operated on the system of the Cleveland Railway Company was placed in service Sept. 16, 1912. One hundred are now on our lines and a second hundred will shortly be added. The operating features of this equipment necessitates a brief description of the car itself.

The extreme length is 49 ft., and there is no platform or vestibule at either end. A continuous longitudinal seat completely encircling the interior gives a maximum seating capacity of seventy-two and leaves a very large area for standing passengers.

The cars are mounted on Brill No. 67-F trucks, with 22-in. wheels, bringing the floor of the trailer close to the ground and making entrance to the car easy. It is but one step from the ground into the car—15 in.—and a second step of the same height to the car floor proper.

There are two doors in the center of the car, one for entrance, the other for exit. The fare box is placed opposite the post which separates the doors. The conductor's position at the box is facing the rear so that an aisle is open between the fare box stand and the devil-strip side of the car. The stand supporting the fare box has a small shelf for change, on which is mounted a set of push buttons to govern the doors. Each door is opened and closed by compressed air electrically controlled by the conductor through the push buttons. The opening and closing of the doors flashes signals to the motorman by an electric contact, which should make trailer operation much safer than when he is entirely dependent on the signal bell.

The trailer is pulled by a 38-ft. motor car, equipped with four 40-hp motors of the Westinghouse 307-F type. The train is equipped with Westinghouse semi-automatic brakes and is coupled with the Tomlinson automatic air coupler. The couplers, while not yet entirely perfect, are a great improvement over the couplers in general use on the old-type train. Cars equipped with the modern automatic air coupler can be coupled much more quickly and with much less danger to the employee than formerly, while the application of air brakes to both cars reduces very largely the danger of accidents through the heavier equipment. These two features, we believe, with the electric signal device, give the requisite safety both to employees and the public.

When these trailers were first put in operation it was decided that we should use them only during the rush hour, morning and evening, and that trains would be left coupled so that it would not be necessary to switch, couple and uncouple them several times each day. This method of operation is still pursued and at present the motor cars are

laid up during the greater part of the twenty-four hours. Upon the arrival of the next hundred trailers, however, it will be necessary for us to uncouple the trains in order to have the use of the motors during the day.

The first, and probably the greatest, advantage in operating trailers is in the cost of equipment. It will readily be seen that the elimination of motors and other electrical equipment from the car greatly reduces the cost of the equipment necessary to move rush-hour traffic, and the investment in idle equipment is smaller in proportion.

A second advantage is the carrying capacity of the trailer. In our case it is about twice that of the motor car. Seating seventy-two, while the motor car seats but thirty-eight, the arrangement of seats noted earlier in this paper gives the trailer a standing area even larger in proportion than the similar area in the motor car. Thus, while the seating capacity of one of our trains is 110 passengers, we have carried over 350 passengers on a rush-hour trip, and it is not unusual to find 200 passengers on one trailer.

Another advantage is the reduction in operating costs made possible. The heavy extra loads just mentioned require the addition of only one man to a crew to handle, the trailer being in charge of one conductor and the train manned by the regular crew.

All the cars on the system of the Cleveland Railway are equipped with fare boxes and most of them are operated on the pay-enter plan. When the trailers were adopted it was intended to operate them also as pay-enter cars, but on account of the single-entrance and no-platform features it was found that loading took too much time and the method was changed so as to utilize the rear half of the trail car as a loading platform. Passengers boarding the trailer pay their fare as they go past the fare box to the front end of the car, or, if they go to the rear of the car, they do not pay their fare until leaving the car. In this manner about half of each load pays fare on the pay-enter plan and the other half on the pay-leave plan. This method has proved very satisfactory and little confusion resulted from the change in method even when first put into effect.

We did experience a great deal of trouble for a time on account of the slowness of trains in getting over the line when mixed with single cars. It developed, however, that the slowness of operation was due rather to the inexperience of the platform men than to the number of passengers carried on the trains, and after six months' operation, we find that the amount of time necessary to operate a train over a given line is but little more than the amount required for a single car on the same line. The difference is so small in comparison to the amount of money saved in equipment and in the number of trainmen worked as to be negligible.

In making up our schedules we arrange all runs so that both motormen and conductors can act as conductors on trailers during the rush hours. This, of course, requires fewer men to operate our schedules with any given number of cars than would be required if each car must be operated by two men. We find, also, that our runs can be arranged to better advantage by this method.

The train signal system between conductors and motormen is giving us some little trouble, trains being delayed for signals and slow in getting away from stops. Under our rules, even though a motorman receives his bell signal from the conductor he should not start his car until he receives the signal light in the vestibule, indicating that all doors on the train are closed. Our present equipment being over-taxed in the rush hours, it often happens that passengers, attempting to crowd their way into cars already filled, stand in the doorways and prevent doors from closing. The conductor, busy at the fare box, is unable to get to the door to get the passengers off the step. So it has been necessary to station inspectors at some points to clear the steps so that doors may be closed and the train properly started. We believe that this trouble would entirely disappear if we were operating sufficient cars to take care of the traffic and

to prevent passengers gathering in such large numbers.

The distribution of equipment, ever important, is especially vital to the success of trailer operation. We have not yet been able to work this out to the best advantage because of the mixing of single cars with trains, already referred to, but are hopeful that with the second hundred trailers a better adjustment can be made.

Little trouble has been given us at switches on account of operating trailers. Some motormen in their endeavor to keep their trains on time accelerate their motors too quickly when passing over switches, not waiting until the rear truck of the trailer has cleared the switch before they attain the maximum speed of their motors.

The operation of trailers in connection with peak-load city service depends entirely upon the peculiar local condition of the particular city service to which the trailer is to be adapted, and I have thought best to give you merely our experience without attempting the broad application of that experience. But I would say this much—as a personal opinion—I feel that the trail car is suitable only for peak loads, and they must be real peaks. A four-minute headway is the minimum which I consider warrants trailer operation.

THE INTERURBAN RAILWAY VERSUS THE CITY RAILWAY

BY JAMES M'PHILLIPS, ATTORNEY HUDSON VALLEY RAILWAY

In the analysis of this proposition, naturally, the conclusions reached by us are largely derived from our experiences with the properties with which we are connected and from observations of the conditions obtaining on the lines of the properties immediately adjoining.

The Hudson Valley Railway Company operates 113 miles of railroad, exclusive of traction rights over the lines of the Schenectady Railway Company and the United Traction Company. This route takes us through twenty-one towns, eleven villages and one city. The city of Glens Falls, the general office of the company, has a total mileage of 7.34, so it is apparent that over 90 per cent of the railway of the Hudson Valley Company is interurban. Outside of the city of Glens Falls and some of the villages, its system is entirely single-track. Cars are moved in accordance with timetables prepared at least semi-annually and under the direct control of a telephone dispatching system.

The operation of a city service has problems which are not encountered when the cars of the railway company are operated over its own private right-of-way. The routes of the city service are entirely through streets, avenues and highways. Cars follow one another at frequent intervals but are often interrupted by the vehicular traffic at one point or another; by collisions with teams or pedestrians which necessitate delay and the expenditure of some time, the extent depending upon the seriousness of the accident, either in assisting to remove the obstruction from the track or in caring for the injured and securing the names of the persons in the vicinity who witnessed the occurrence.

There are also many petty annoyances to contend with which come from people who are oftentimes successful business men and most economical in the management of their own affairs, but at the moment a rumor is started, no matter by whom, that an insufficient number of cars is being operated to meet the wants of the traveling public, or that some other fancied wrong exists, are quick, even eager, to declare it a fact.

The necessity for the re-setting of poles, the repairing of a low joint, the cutting out of a piece of broken rail or the repairing of a bond in a paved street brings many senseless complaints from abutting property owners and inquiries why the street in front of their property is being torn up. The answer is always given, although it takes time and patience.

On the interurban lines we are confronted with complaints about the insufficiency of cars and the improper heating of those operated, springing from sources founded upon the same plane of reasoning as those affecting the city service, and these have to be dealt with in a generally similar manner.

There are, however, factors in this operation which need more constant attention and care on the part of the management than are required in the city service. The high speed at which the cars are operated necessitates the perfection of track and rolling stock, as nearly as may be, for should a car traveling at this speed be derailed the injury to passengers, if not loss of life, as well as the damage to property, would be great. The necessity for a full corps of experienced men who are familiar with high-speed operation, and with the dispatching order system where the line operated is single-track, to answer a call to man the regular trains or take an extra or special car to any part of the system is always present. These are matters which I feel are continually in the mind of the interurban manager.

With our company one of the most important matters in the operation of its interurban lines is the question of keeping cars on schedule time. This is attended to so carefully that in the event of an interurban car breaking down on any of the lines from a terminal the crew immediately notifies the dispatcher and he arranges to send an extra to the terminal point to take the place of the regular car, so that the only persons inconvenienced are those in the crippled car or those along that car's route.

The employees of our company take particular pride in reaching terminal points according to schedule, and it is a matter of general satisfaction to the patrons living along our system that our trains are to be depended upon, barring unavoidable accidents and delays.

Of course, the question of schedule time carries with it problems more difficult than that of merely providing an additional car. The power must be ready at all times when called upon for a heavy load, and it may be of interest to know that from July 15, 1909, up to a few days ago the longest delay to the cars on our system from the cause of failure of power was less than fifteen minutes. A few days ago, however, during one of the worst sleet storms that ever visited this part of the country, we underwent a shut-down of fifty minutes on account of trees coming in contact with the high-tension lines; but at no time was the entire system out of commission, as by our auxiliary plants, where direct-current machines are constantly in operation, several sections of the road were kept running.

For years our company operated large double-truck open cars on its interurban service, but on account of the numerous accidents to passengers and the annoyance and inconvenience of transferring equipment during stormy weather, all through service for the past three summers has been operated with closed cars.

During the first summer after the change a considerable decrease in the earnings was noticed, as the people had been educated to use the open cars, but the second summer all objection was practically waived, and now there rarely is a complaint from that source, while the earnings per car mile are as great as with the open cars. We still use the open cars for city traffic and excursions on the interurban lines, and we are called upon several times during the summer to transport at one time from 300 to 700 children belonging to Sunday schools and other organizations. But these open cars are not operated at high speed.

I have endeavored to give but a brief synopsis covering my subject, and in conclusion I beg leave to say that, in my judgment, the relative percentage of trouble caused by complaints in the operation of an interurban as compared with a city railway is altogether in favor of the interurban line. The number of complaints received at our general office concerning the operation of the interurban cars is in the ratio of about one to ten received from the city line.

THURSDAY EVENING SESSION

(By Telegraph)

An informal dinner, held on Thursday night, was generally attended by the visiting delegates. During the dinner music was furnished by an orchestra and impromptu choruses were sung by the diners. Two solos rendered by W. H. Hyland were greatly appreciated. After the dinner President Collins read letters of regret from members of the association who were unable to attend and then introduced C. S. Sims, vice-president Delaware & Hudson Company, as the first speaker. Mr. Sims spoke upon the operations of American steam railways as compared with those of Europe, summarizing his remarks in the statement that American railways had one-fifth of the capitalization of English railways, handled double the business, charged one-third of the rates, paid double the wages and yet were supported by only one-seventh as dense a population per mile. He commended the electric railways for making a profit on passenger business out of 5-cent fares whereas steam railroads lost money at a rate of 2 cents per mile.

The second speaker, Rolin B. Sanford, district attorney of Albany County, said that old-time managers, in answer to complaints, would promise much and perform little, but that the modern manager made a policy of reasoning with the public, explaining just how much he could do and then doing it. He did not believe that the majority of the public was unreasonable. For instance, the people of Albany naturally wanted a 5-cent fare but would be willing to pay more if it was demonstrated that better service demanded an increase.

The third speaker was Chairman Frank W. Stevens of the Public Service Commission of the Second District, New York State, who spoke about the duties of public service commissioners and their mutual responsibility to both the public and the corporations. Fairness, he said, did not mean giving one party half of its demands, but instead, consisted in listening to arguments of both sides and then making decisions irrespective of who the parties were. The ideal of a public service commissioner at all times should be to promote better feeling between the people and the public service corporations. Past evils, he said, were due largely to misconceptions and misunderstanding, and conditions had greatly improved since 1907 when the New York Public Service Commission came into being. He was proud to say that of 135 employees of the commission not one had been appointed for political reasons. Since there would soon be three new commissioners, he asked the railways to give them every possible aid and consideration. If the railways felt that they were not being treated justly, they should protest as vigorously as the public against bad railway service and good results were certain to follow eventually.

Mr. Sims then proposed a rising toast to Chairman Stevens for his honesty, fixity of purpose, enduring energy and absolute fairness, and, in response, a splendid ovation was given by the delegates to Mr. Stevens.

J. S. Kennedy, secretary of the Public Service Commission of the Second District, New York State, said that when he left the service of the State he would long cherish recollections of his pleasant intercourse with the electric railway men of his district. The New York Electric Railway Association, he said, should embrace every railway and railway employee in the State. By so acting together they could best secure that publicity which would place them in the proper position before the public.

President Collins then expressed his deep regret over the anticipated retirement of Messrs. Stevens and Kennedy and presented the following resolution, which was unanimously adopted:

"The officers and members of the Electric Railway Association, assembled in quarterly session at the Fort William Henry Hotel, Lake George, N. Y., March 6 and 7, 1913, unanimously express their sincere regrets at the anticipated

retirement of the Hon. Frank W. Stevens from the Public Service Commission, Second District, State of New York.

"We commend the courtly dignity of Chairman Stevens and his able grasp of the complex subjects brought before the commission. We appreciate his broad-minded and impartial views upon all matters wherein the public welfare is involved. We extend to Mr. Stevens our best wishes and our hope that a rich reward will be his during his future active career.

"The officers and members of the New York Electric Railway Association, assembled in quarterly session at the Fort William Henry Hotel, Lake George, N. Y., March 6 and 7, 1913, also unanimously express their sincere regret at the retirement of Mr. John S. Kennedy, secretary, from the Public Service Commission, Second District, State of New York.

"We gratefully acknowledge the many courtesies extended to us by Mr. Kennedy and sincerely appreciate his cheerful co-operation throughout our business intercourse in shaping and stimulating our efforts to greater achievements for the good of the traveling public. We congratulate ourselves that a spirit of harmony has always prevailed in our relation each to the other, made possible by his wisdom and rare executive ability. We extend to Mr. Kennedy our thanks and the sincere wish that success may attend his future efforts and that prosperity may always be by his side."

In response to these resolutions Chairman Stevens bade an affecting farewell to the association. He said that it had been five years and eight months since he had entered office with the single thought to do the best he could, and that that was all he had done. After another hearty ovation to Messrs. Stevens and Kennedy the meeting adjourned.

FRIDAY'S SESSION

(By Telegraph)

The meeting was called to order by President Collins on Friday morning at 10 o'clock. The first paper to be read was that of James McPhillips, attorney Hudson Valley Railway, entitled "The Interurban Railway versus the City Railway." This paper is published elsewhere in this issue.

H. J. Childs, engineer power distribution United Traction Company, then read a paper entitled "Some Power Distribution Problems," which appears elsewhere. In the discussion J. P. Barnes, Syracuse, asked whether the Albany underground cable was specially insulated or was of the plain weather-proof type, Mr. Childs replying that covering for the cable was of lead and paper. Mr. Townsend, Albany Southern Railway, stated that he had installed submarine armored cable in the bottom of a river and that after seven years of service it had given no trouble. Signs of electrolysis of the armor had been noticed, but this was stopped by connecting the ground wires to the rails. B. Penoyer, Schenectady, said that he understood that the United Traction Company was using clinch ears and he doubted whether successive substitution of larger ears would be practicable with this type.

A paper entitled "The Successful Claim Agent" was then presented by William H. Hyland, Gloversville, N. Y. This is abstracted elsewhere in this issue. In the discussion which followed the claim agents present at the meeting expressed general agreement with the author's ideas. Mr. Townsend suggested that the association should have a man go over a railroad for evidence of things which might lead to accidents, both in equipment and in the work of employees. He suggested the use of moving pictures of accidents as exhibits in electric railway parks. Mr. Hyland thought children should receive special training with regard to protecting themselves against accidents and that the training should begin in the kindergarten. He added that the Legislature should make accident-prevention instruction by public school teachers compulsory.

In a general discussion as to whether claims should be

paid by check or cash it appeared that most of the claim agents believed that the moral effect of spreading out bills before the claimant was bad. The discussion also revealed that the amounts of cash which claim agents had available for immediate use varied from \$75 to \$500.

The last paper upon the program was entitled "Operation of Trailers in Connection with Peak Load City Service," by George L. Radcliffe, Cleveland, Ohio. This is published in abstract on another page. Upon its completion the discussion of the question box was opened.

The first question was in regard to the attitude of the delegates toward standard instructions for governing the operation of workmen in the inspection and maintenance of equipment. W. G. Gove, Brooklyn, said that standard practices had been installed on the Brooklyn Rapid Transit System despite the fact that there were seventeen shops with from 1200 to 2000 men employed. He believed in circular letters and bulletins and in furnishing ample drawings. His department was, he said, completing a book of standard shop rules and instructions. Publicity and conferences had succeeded so well in changing the habits of the older employees that the average length of service of shop foremen and superintendents was more than fourteen years. John Sibbald, Gloversville, said that he believed standard instructions were equally desirable for small railways as it was becoming more difficult to obtain good all-around shopmen. J. P. Barnes, Syracuse, said he had checked the work of car inspectors by keeping records of men who had last inspected crippled cars. He had then posted the car numbers alongside of the numbers of other cars which were inspected daily by other men, thus showing the relative efficiency of the inspectors.

The second question, whether timekeeping should be done by the auditing department or by the department involved, produced a general discussion. W. H. Elder, Albany, thought that the accounting department should do this work. Individual time slips properly approved by the foreman and master mechanic should, he said, be used even with time clocks. Complaints of errors in pay checks had been greatly lessened since the operating department had been relieved of the responsibility for timekeeping. F. E. Belleville, Schenectady, said that he used both methods, the operating department keeping its own time while the transportation department sent its sheets to the accounting department for making up the pay-roll. Mr. Gove favored having the auditing department do the timekeeping. A pay-roll department was best for a large system.

The third question, regarding the relative merits of concrete and composition floors for cars as compared with wooden floors, was then placed before the meeting. John Sibbald, Gloversville, said that uneven wear could be easily taken care of with the composition floor, but that dust from worn floors would settle on plush seats. Neither composition nor linoleum needed painting as often as wood. Mr. Gove favored composition floors as installed in the new Brooklyn center-entrance cars for hygienic reasons. Mr. Barnes mentioned the possibilities of the interlocking tile floor costing about \$1.15 per square foot. He cited a case in which this type had shown no wear after six years' service although located in the aisle between car seats.

In answer to the fourth question, regarding the best kind of joint for use in paved streets by a small railway which could not afford riveted or welded joints, Mr. Penoyer believed that the bolted joint was the best under the circumstances. It had been used successfully in Schenectady for four years. A drilled rail and punched plates were used, the holes being of the same diameter but not reamed. A 1½-in. machined bolt with square head and hex-nut was used and a reasonably tight fit was thus obtained. F. A. Bagg, Gloversville, N. Y., used rails drilled 1/16 in. less than the size to which the bolt plates were punched. The holes were then reamed and machined bolts driven in.

The original plan called for a bolt $1/32$ in. larger than the hole, but as this was found too hard to drive the difference in size was later changed to $1/64$ in.

Mr. Penoyer said that although he was conducting the use of the construction as described he was giving up the use of splice bars for continuous plates.

In answer to the fifth question, as to whether any injurious results occurred to the rail or equipment when the rail was rigidly supported on concrete foundations, Mr. Penoyer said that 75 per cent of the track in Schenectady was laid on 6-in. concrete foundations. Some of this had been installed since 1901. The only corrugation was found at the bottom of a grade where there was no concrete. He favored crushed stone for locations where concrete could not be permitted to set for a period of at least ten days.

The sixth question placed before the association was a query whether there was any good preservative treatment for wooden ties other than creosoting. Mr. Bagg referred the members to a paper presented before the American Railway Engineering Association on the subject. Mr. Townsend had dug out good kyanized ties after fifteen years and had laid them again for a suburban line. Mr. Penoyer had been using creosoted ties exclusively for all interurban renewals and for paved streets with crushed-stone ballast. He used 10 lb. of dead oil per cubic foot with a penetration of $1\frac{1}{2}$ in.

In answer to the seventh question, regarding the desirability of replies through the press to public complaints or criticisms, J. F. Hamilton, Albany, did not believe in replying to every criticism, but thought it wise to call in newspaper men, explain fully the reasons for making changes and then ask them to publish statements that the company would gladly hear objections to the proposed plans. He had little difficulty in satisfying complainants that the company was anxious to route its cars so as to serve the convenience of the greatest possible number of the riding public.

R. M. Colt, Gloversville, brought up the point that newspapers wanted early publication of all stories and that this led to inaccuracies when the information was obtained from outsiders. It was important to have local newspapers understand that they could confirm rumors by telephoning to the company.

In meeting the questions on the method of making charges for the carriage of newspapers and on methods of payment for the service there was a general agreement that the use of pasters was satisfactory and that straight charges should be made both for advertising by the paper and for transportation by the railway company.

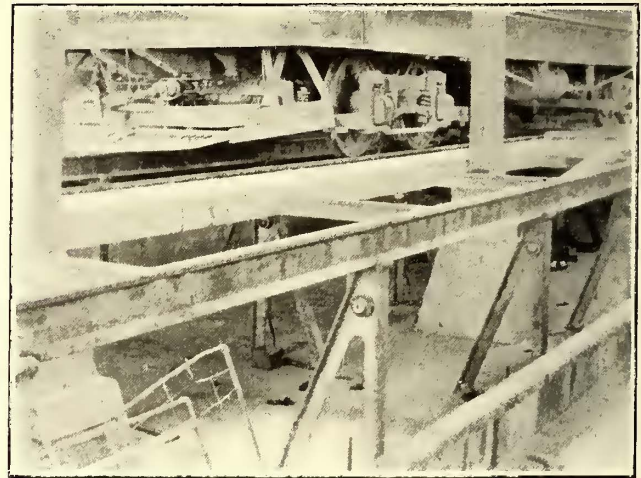
In answer to the question regarding the desirability of contracts with hotels and mercantile concerns for calling the names of their places of business by street car conductors, C. E. Holmes, Albany, said that he found that this led to trouble where only one of several hotels on a street was called. R. M. Colt, Gloversville, however, said that he thought the scheme was a good revenue producer where it did not interfere with traffic. He said that his company had received \$277 a year from one store.

The meeting then adjourned.

An American consul reports that a city in Italy has been making investigations relative to the construction of an electric tramway, 28 miles long. The estimates, amounting to \$521,100, were recently submitted to the investigating committee by the engineer appointed to make a report on the project. The equipment needed will include rails, overhead material, telephone line, passenger, freight and baggage cars, power plant, machinery, etc. Interested persons should communicate with the person named in the report and correspondence should be in Italian. Further information can be obtained by addressing No. 10,033, Bureau of Manufactures, Washington, D. C.

IMPROVING THE LIGHTING OF A CARHOUSE PIT

For electric railway shops and carhouse employees obliged to spend a large amount of time working in pits on the under sides of rolling stock the question of adequate lighting is an important one. In many shops where cars are regularly inspected and repaired an attempt is made to get along with portable 16-cp lamps wired simply with flexible cord from some distant outlet. In a new carhouse of the El Paso Electric Railway at El Paso, Tex., the pit lighting has been provided by the installation of outlets on the steel framing which supports the tracks, as shown in the photograph, as the space under the rails is unusually clear. Four lamps are thus provided in each so-called pit bay, and in



Improved Lighting Arrangement of Pit at El Paso

special cases portable units may be used as freely as the fixed lamps. The betterment of the lighting facilities is an important factor in the speed and accuracy with which the work of car repairs and inspection can be handled.

REVENUES AND EXPENSES OF STEAM RAILROADS

The Bureau of Railway Economics has just issued Bulletin No. 44, which gives a summary of the revenues and expenses of the steam railroads in the United States during the year 1912. The figures are compiled from the monthly reports from railroads to the Interstate Commerce Commission and apply to the railways having total operating revenues in excess of \$1,000,000. These lines operate 220,058 miles, 90 per cent of the steam railroad mileage of the United States.

The results for the year 1912 are shown in the accompanying table:

	Amount per Mile of Line, 1912	Percentages of Total Operating Revenues
Total operating revenues.....	\$13,287	100.
Freight	9,241	69.5
Passenger	2,980	22.4
Other transportation.....	924	7.0
Non-transportation	142	1.1
Total operating expenses.....	9,139	68.7
Maintenance of way and structures.....	1,700	12.8
Maintenance of equipment.....	2,131	16.0
Traffic	272	2.0
Transportation	4,715	35.5
General	320	2.4
Net operating revenue.....	4,148	31.3
Outside operations—net revenue.....	7	...
Taxes	545	...
Operating income.....	3,609	...

The total operating revenues for 1912 amounted to approximately \$2,924,000,000, an increase over the previous year of 6.3 per cent. Increases in both revenue and operating expenses occur in all cases for the railroads as a whole, but of the three groups into which the railroads are divided the Southern group showed a decrease in operating revenue, owing to the fact that the increased operating expenses overbalanced the total increase in operating revenues.

GASOLINE SURFACE CARS IN INDIA

One year ago the surface railways in Karachi, India, completed the replacement of their horse-drawn cars with a novel form of gasoline motor car. The change of power had been going on since the year 1909, when the first experimental equipment of the new type was placed in service.

The car, as shown in the accompanying halftone, has been reduced to the simplest possible form. The motor is placed underneath a permanent seat in the center of the car and is connected by a chain drive to one of the axles.

maintenance, while the horse cars previously in use, which seated only thirty passengers, used to cost slightly over 6 cents per car mile. The same report states that the introduction of gasoline cars has produced a material increase in traffic, largely on account of their popularity with the natives and their ability to provide a much more speedy and regular service. In view of this the directors at present are contemplating extensions for the development of the outlying districts of Karachi amounting to some 3 miles of new line.

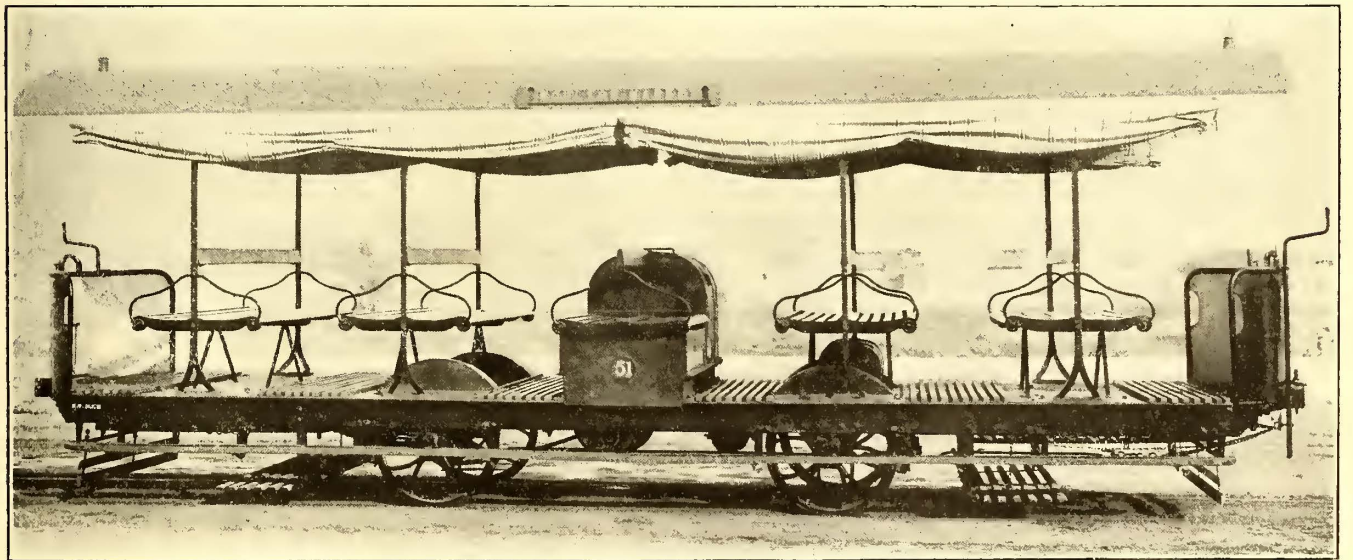
It is reported that the new cars run about as fast and as quietly as the average electric surface car, and on account



Gasoline Motor Cars in India—View of Cars in Service, Showing Native Motormen and Conductors

Hand brakes are used and the entire construction of the car is made as simple and as light as possible, the roof being of the canopy type supported by iron stanchions. The engine is controlled from the ends of the car by a simple arrangement of rods and levers which operate the clutch and the throttle. The levers are located just back of the dashboards. The motor is set at right angles to the center line of the car so that no necessity for beveled gearing exists,

of the location of the motor in the center of the car, where it is fully supported by springs, the vibration customary with the gasoline engine drive is largely eliminated. The simplicity of operation has permitted the company to utilize the natives who formerly drove the horse cars as motormen for the new motor cars. The installation at Karachi includes thirty motor cars, of which all have been in operation during the past year, and it is reported that the street



Gasoline Motor Cars in India—Type of Car Used Exclusively on Street Railways of Karachi

and in consequence the cars are reported to run with very little noise.

The report of the East India Tramways Company covering its lines in Karachi states that the new motor cars, which seat forty-six passengers, are operated at an average cost of only 3 cents per car mile for power, repairs and

railways of Baroda, India, are soon to be equipped with cars of the same type owing to their successful introduction in the former city.

Karachi is one of the principal seaports of India. It has a population of more than 100,000 and has been largely rebuilt and greatly improved.

INAUGURAL CONFERENCE OF THE SOCIETY FOR ELECTRICAL DEVELOPMENT

The conference which the Society for Electrical Development, Inc., held in the United Engineering Societies Building, New York, on March 4 and 5 was the first tangible result presented to the electrical industry at large of a vast amount of detail work that had been performed by the committee which was appointed by representatives of the central stations, manufacturers, jobbers, contractors and dealers at the meeting held by these interests at Association Island, New York, on Sept. 3, 1912, to create an organization to carry on a co-operative electrical movement throughout the United States.

About 175 were present when President Henry L. Doherty called the conference to order at 10 a.m. on March 4.

Mr. Doherty made a few remarks to explain the reasons for holding the conference. First, he said, the organizers of the society had been anxious to get the movement actually under way as soon as possible, and, secondly, it had been thought that a much broader line of ideas would be developed at a meeting open to the entire electrical fraternity than would have been the case had the society simply presented its own plans. Had the latter method been followed, the industry at large would probably have given more attention to merely improving the details of the society's plans than to developing valuable ideas for carrying on the work. Mr. Doherty then said that while only a short time had elapsed since the society had been organized, a keen interest had been shown in it in all parts of the country, as in all branches of the industry.

James M. Wakeman, general manager of the society, then spoke on the "Aims of the Society."

The society, he said, was the result of thought, money, time and effort on the part of hard-headed business men and it was expected to be a potent factor for increasing the demand for electrical energy, supplies and apparatus. He pointed out that a great deal more could be accomplished by joining forces than by individual effort. Co-operative, constructive work was now needed, he felt, in the commercial side of the electrical industry, which had reached a stage of successful production.

SOME METHODS FOR SECURING PUBLICITY

Publicity of a kind that would induce the public to realize the advantages and economies of electrical energy was what is needed, he thought. Some of the methods he suggested for securing this were: advertising on a large scale in magazines and newspapers and having articles of electrical news value written by well-known men whose names would insure that these articles shall be read; supplying the daily press with electrical news; exhibiting moving pictures of electrical interest; having the technical press analyze the business practices of successful electrical manufacturing concerns, contractors and supply dealers; educating farmers, architects and others in the great merits of electrical service.

For the last purpose a traveling force could be maintained by the society, while a corps of trained solicitors could also be maintained and placed at the service of small companies, at a small charge, for special campaigns.

In conclusion, Mr. Wakeman stated that the society had received the indorsement of many of the national electrical associations, manufacturers and the technical press, and that its far-reaching connections could make it the greatest "booster" ever known.

THE NEWS VALUE OF ELECTRICITY

Frank H. Gale, of the General Electric Company, then read a paper on "The News Value of Electricity," in which he said that news should be written and treated from the standpoint of the reading public, not from that of the advertising writer. Only items of real, legitimate news value, of interest and benefit to the public, should be furnished to newspapers.

Of this material, the part that was of a technical nature did not appeal to the general public, but was useful to the technical press. On the other hand, there was always much in which the general public would take an interest. Real news and press-agent matter must be kept entirely separate.

Public-service corporations had long since found out that frankness and publicity pay. Where officers of such companies had been close-mouthed and loath to talk to representatives of the local press, the reporters had often turned in unfavorable items pertaining to the central-station companies for lack of other news. Central-station managers should keep in touch with the newspaper men in their territory and encourage them to visit their offices.

Mr. Doherty stated that nowadays newspapers realized that press-agent work had been greatly overdone and the newspaper tendency is to reject business items. He thought that the newspapers should point out to business men where they should draw the line. He felt that there were hundreds of untold items concerning the electrical industry that were far better than those appearing in the daily press.

C. G. Durfee, of the Rochester (N. Y.) Railway & Light Company, said that it was not difficult to get newspapers to publish items if approached in the proper way. In explanation, he told how difficult it had been in Rochester a few years ago to get any electrical news in the local papers, and how after R. M. Searle, vice-president of the company, had told each employee that he might say anything whatsoever to reporters concerning the company's affairs, provided he always told the truth, conditions had been vastly improved.

In this way every person in the organization had been made an intermediary between the company and the local press, and the only restraint placed on any man was the proviso that he should always tell the truth.

Mr. Durfee said that as a result of this policy Rochester papers had few editions in which a good legitimate piece of electrical news could not be found, and the effect of this had been the growth of much better relations between the company and the public, and the company and the newspapers, all of which, he stated, probably was more beneficial to the company than its paid advertising in the newspapers.

All of those in the company were in accord with the reporters, and the latter visited the higher officials each day and made at least one visit per week in all the departments.

Oftentimes, Mr. Durfee said, the name of the man who gave the story to the reporter appeared in print, and some discussion had taken place at meetings of department heads as to whether this was desirable. It had been decided, he said in conclusion, that the articles would lose much of their news value if the name of the person was omitted. This added the personal, or human-interest, feature to the item.

L. W. Sammis said that, speaking from twenty-five years' experience on New York papers as a reporter and editor and also an advertiser, he knew of no trouble in getting items in the daily press whenever they had real news value. He recommended being with the newspapers and seeing that what was sent to them was in a concise form with something of interest in it.

James H. McGraw, president McGraw Publishing Company, said that news items written along the line suggested by Mr. Gale would be real news and would be welcomed as such by the papers. There was no mystery of any kind concerning publicity matter; it was a straightforward, definite matter nowadays. The man who did not give intelligent thought to the matter was the one who did not understand the language in which publicity items should be treated. What had been done in Rochester—convincing the newspapers that the public-service company there was telling the truth to them at all times—could be done everywhere, in every town and city, and if that policy was followed, the industry need have no fear of the daily press.

D. T. Pierce, McGraw Publishing Company, stated that in many years of experience as a newspaper man he had found that corporation heads often lost sight of the vast

amount of benefit which their corporations could receive from proper publicity work at the right time. He told of a railroad company which had followed this method, sending information to its station agents from its publicity office and letting the agents give local reporters the news items. This had made the station agents a factor in the local news. He told something of the vast amount of matter that came into a daily newspaper office and was rejected. For this reason care must be taken to get something of special interest in a news story in order to make it acceptable.

Following this a series of papers were read upon various topics, including "Electricity and the Architect," "The Dissemination of News," "Efficiency in Local Advertising," "The Sales End," "Merchandising Co-operation" and "An Electrical Advertising Campaign." The papers provoked interesting discussions, the entire program extending over two days, including a night session on Tuesday.

ELECTRIFICATION OF STEAM RAILROADS

During this session W. J. Clark, of the General Electric Company, stated that he wished to call attention to one thing that had not been mentioned, one of the greatest features in the electrical industry of the present day, namely the electric railway load. This, he said, was rapidly coming closer to the central stations.

In spite of the debt which the latter now owed to Samuel Insull for his work in developing that type of load, the present load, Mr. Clark said, was nothing compared to the one they would receive from steam railroads in the next few years, with continuance of the present rate at which electrification of such great systems was being completed. The electric railway load was now, he said, one of the biggest in the central-station industry.

At the conclusion of the sessions it was announced that the executive committee would begin on March 6 to digest all that had been proposed and discussed at the conference.

On Wednesday evening a banquet was held at Delmonico's, T. C. Martin presiding as toastmaster. A number of speeches were made by representatives of the daily press and the electrical manufacturers. On behalf of the technical press, Hugh M. Wilson, vice-president McGraw Publishing Company, said that the society had under way a scheme to educate the public, but that it must not forget that a good teacher must be well taught. The technical press could be of great assistance. In a large measure, electrical papers must become not less technical but more commercial, for whatever else they do they must represent the spirit of the times, and this spirit showed the constantly increasing predominance of the commercial element. He asked for the confidence of the commercial side of the industry and for knowledge of what the commercial side of the industry was thinking and doing.

Following brief remarks by Mr. Wiley, of the *New York Times*, President Tait of the National Electric Light Association voiced on behalf of his organization hearty approval and support of the society and its plans and said that he hoped to be able in some way to convey to the N. E. L. A. members some part of the enthusiasm which had characterized this week's meetings.

Concluding the speaking, Mr. Doherty said, in part: "I believe in my business, I believe in the corporations, and I believe that we occupy a position of importance in bringing prosperity and comfort to others. In working to develop electricity, we are working toward a higher and better civilization. Consolidations formed for good reasons and honestly conducted are bound to result in public good, but these consolidations are now under fire, and we are told that they are a menace to the people. I believe we have now hit upon a plan to get the benefits of co-operation, a plan that can harm no one and must bring good to every man in the electrical business. It may be that the example we are setting here will mark the introduction of a new method for advancing supremacy, not only in the electrical but other industries. German industrial progress is due to

the policy of business encouragement, not discouragement. Here we have antagonism and discouragement, and I fear the story of our future may not be as pleasant as the story of recent German industrial advance. To do what we can to correct this situation is one of the many important duties of this society."

LONG RUN OF STORAGE BATTERY CAR

A run of 310 miles from New York to Boston via the Hudson River and Boston & Albany routes was successfully made on March 6 by a new Beach-Edison storage battery car. The trip was particularly interesting in that it demonstrated to representatives of steam roads for which the run was made that this type of self-propelled car can maintain high average speeds for distances considerably in excess of 100 miles. The car with which the trip was made will be delivered to the Boston & Albany Railroad at Boston, where it will be operated in suburban service.

Ralph H. Beach, of the Federal Storage Battery Car Company, acted as host. Among his guests were the following: E. J. Wright, general superintendent; C. F. Smith, general superintendent of passenger transportation; L. F. Vosburgh, general passenger agent; G. H. Wilson, superintendent of the electric division; C. K. Broadhead, trainmaster of the electric division; E. B. Katté, chief engineer of electric traction, all of the New York Central Railroad; the following representatives of the Federal Storage Battery Car Company: R. A. Bachman, J. P. Warren, M. E. Harby, E. J. Ross, Jr., and A. H. Dirk; also H. S. Baldwin, G. W. Remington and J. C. Clendennen, of the General Electric Company. The car was run by George R. Blodgett, electrician of the Federal Storage Battery Car Company, and was, of course, piloted over the various steam road divisions by full train crews.

The route followed was interesting in that it offered a long run at practically level grade, climbing a high range and considerable curved track. The car left the Grand Central Station, New York, at 9 a. m. and proceeded to Hudson, N. Y., on the main line of the New York Central. From Hudson to Chatham the car was operated over a branch line of the Boston & Albany and from Chatham to Boston over the main line of the same road.

The car which made this run is 50 ft. long over all, 12 ft. 6 in. high and 8 ft. 11 in. wide. It conforms to M. C. B. equipment interchange specifications and weighs complete with load 34.6 tons. Seats for forty passengers are provided in the main compartments and for ten passengers in the baggage compartment. On the trial run the car carried a combined live and artificial load equivalent to the weight of eighty-four passengers.

The electrical equipment of the car includes four 20-hp. 220-volt Diehl motors and two sets of 230 cells, each of Edison A-8-H storage battery, delivering current to the motors at approximately 240 volts.

The batteries were fully charged when the car left New York, and the run of 114 miles to Hudson was made at an average schedule speed of 35 m.p.h. On arrival at Hudson the car climbed $1\frac{1}{2}$ miles of 2 per cent grade before recharging. The energy consumption for the level run of 114 miles over the main line of the New York Central was $37\frac{1}{2}$ watts per ton mile. Through the courtesy of the Albany & Southern Railroad the battery was recharged from that company's third rail and then the run toward Boston was continued. The car arrived at Springfield, Mass., 98 miles distant from Hudson, with about one-third of the full charge left in the batteries, and this after having climbed the Berkshire Hills to an elevation of 1450 ft. and negotiated many grades, including one continuous up-grade of 1 per cent for 8 miles.

The battery received a short boosting charge at Springfield while the party had dinner. The remainder of the run, 98 miles, to Boston was covered without event.

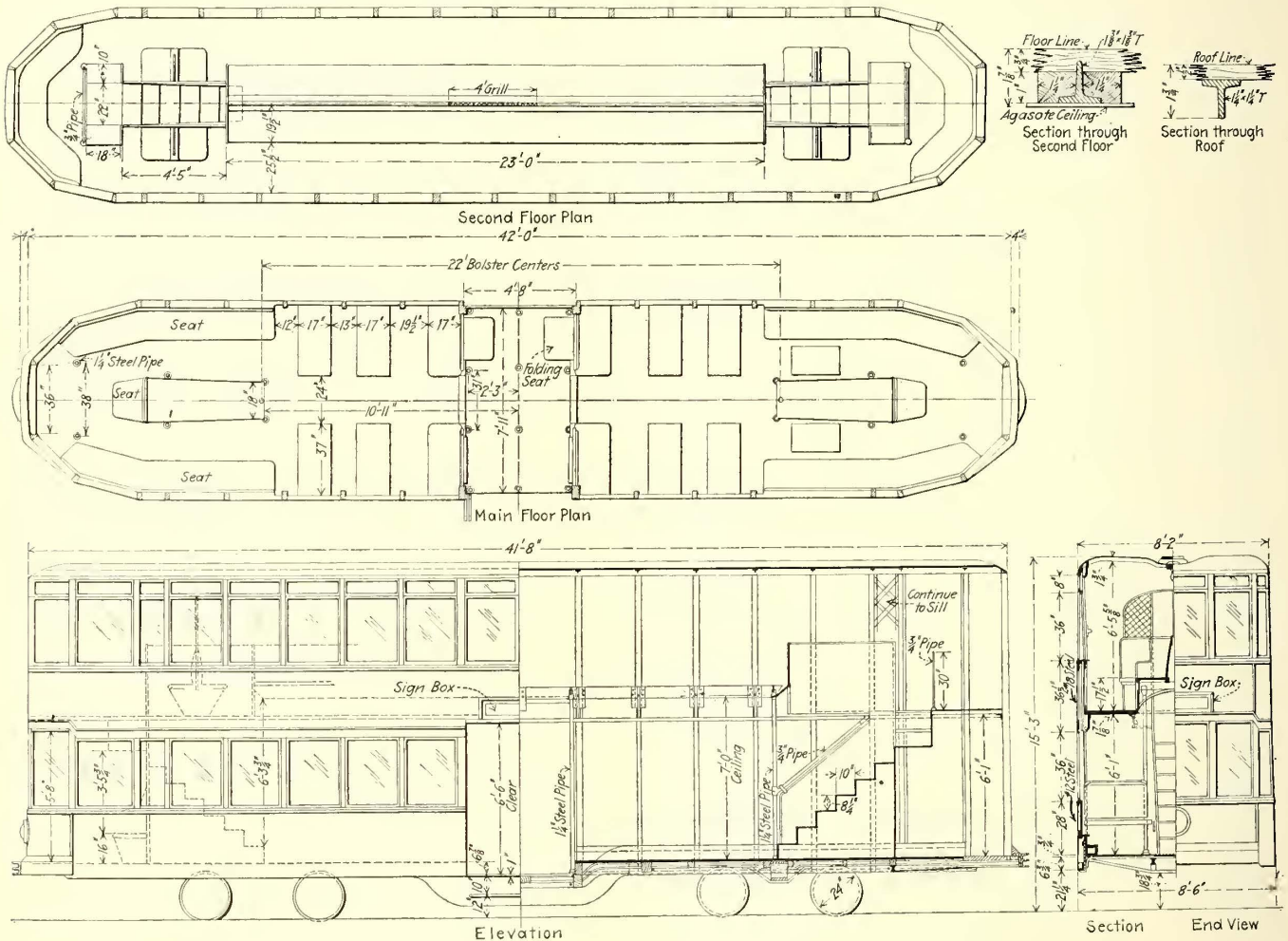
DOUBLE-DECK CAR FOR WASHINGTON

The Washington Railway & Electric Company now has in course of construction by the Southern Car Company a double-deck car combining several of the features of the two designs brought out last summer and in addition embodying several radically new features, most prominent among which is the girder construction of the whole side of the car from side sill to eaves. A center entrance is used and the stairways to the upper deck are at the ends of the car. The height is reduced by the use of 24-in. wheels with small motors to suit.

The car is being built for experimental purposes and it is to be used in different classes of service in the city of Washington to give it a thorough trial. It is being tried with the idea of getting more carrying capacity per unit

ends alongside of the stairways where longitudinal seats will be installed. The seats on the second floor will be set longitudinally back to back. On each side of the stair wells transverse seats, each seating one person, will be provided, so that all of the available space of the upper deck will be used for seats.

The car will be 42 ft. over all and have a width over sills of 8 ft. 6 in. The extreme height will be 15 ft. 3 in. and the first floor will have a clear standing height of 6 ft. 1 in. Access to the car will be effected through a wide center-entrance doorway for which folding doors will be provided. These doors will be operated manually and fold up into two sections at each side of the opening. The floor at the center of the car will be depressed to form a well and this will permit the use of very low steps to the ground level. As shown in the accompanying line cut,



Washington Double-Deck Car—Plans, Sections and Elevations

and per mile of track, as there are some portions of the city where the tracks are very congested during certain hours of the day. The company believes that double-deck cars may improve the existing conditions, and if its use is found practicable under the local conditions more cars of the type will be purchased.

The design is somewhat along the general lines of the company's center-entrance cars, which were described in the ELECTRIC RAILWAY JOURNAL of April 27, 1912, page 687. Two stairways will lead from the center of each end of the car to the second floor. These stairways will be constructed with a platform two steps below the floor level and at that point will turn to the right and the left for the final rise up to the second-floor level.

The car will seat 100 passengers, fifty seats being provided on each of the two floors. On the first floor the seats will be transverse except for a short distance near the

space for the motorman will be provided in front of the stairway and no separate cab will be installed for him.

The electric equipment will consist of General Electric No. 236 motors, of which four will be provided. These are of a special design and have a capacity of 32 hp each. They will be mounted on specially designed trucks of the inside-hung type, all wheels being 24 in. in diameter.

The most radically new feature of the construction is that the sheathing for both the upper and lower decks will be made of steel plate. At the ends of the car, in the position which would ordinarily be taken by the corner posts of a standard car, there will be used latticed steel columns rigidly framed into the steel sheathing of both decks and connected also to the plate at the eaves. This construction permits the whole side of the car from side sill to roof to assist, by its action as a girder, in supporting the weight of the car and its load.

MIDWINTER CONVENTION, A. I. E. E.

The midwinter convention of the American Institute of Electrical Engineers at New York, Feb. 26 to 28, was essentially a working convention, forty-five papers in all being presented and discussed during the eight busy sessions, which closed with a reception and dance at the Hotel Astor Friday evening. Proposed modifications of the present Institute Standardization Rules were presented before the sessions, for comment and suggestions before adoption in the rules.

TEMPERATURE AND ELECTRICAL INSULATION

Representing the sub-committee on revision of rules relating to temperature and electrical insulation, B. G. Lamme, co-author with Dr. Steinmetz of the sub-committee's report on temperature and electrical insulation, presented an abstract of the paper pointing out the unusual character of such an inquiry, merging the best scientific judgment of two rival engineering organizations.

The report of the sub-committee recommends that 90 deg. C. shall be the ultimate temperature limit for class A insulation, suggesting also that 100 deg. C. be considered as the maximum permissible for insulation where long life is a requirement. It further recommends 40 deg. as the limiting temperature for the cooling medium or room and 25 deg. as the reference air temperature. With class B insulations 125 deg. C. is taken as the limit and 150 deg. as the maximum permissible in the insulation. From 80 deg. to 85 deg. rise is here allowable. In making final decisions on the temperature-rise question, the ultimate temperature attained is recommended as the basis, rather than the rise itself.

METHOD OF RATING ELECTRICAL APPARATUS

A sub-committee on methods of rating apparatus reported urging more accurate and international ratings of electrical equipment. The committee strongly recommended rating in "kva" instead of "kw," as specially desirable in the case of generators, transformers, synchronous condensers, etc., while urging the double "hp-kw" rating for motors. In place of the present inexact "intermittent ratings" a set of six A. I. E. E. standards, with appropriate name-plates, was suggested.

After an extended discussion invitations were extended to the National Electric Light Association, the American Electric Railway Association and the Association of Edison Illuminating Companies to contribute, within thirty days, expressions of opinion concerning the proposed ratings.

TEMPERATURE MEASUREMENTS IN ROTATING MACHINES

In discussing the features of standard test methods the indefiniteness of certain of the present Standardization Rules was pointed out. This resulted in measurements of iron and copper temperatures, instead of insulation temperature, although it was the latter, of course, that was of importance.

In discussing methods of obtaining room temperatures and internal temperatures in generators and motors, the use of standard putty coverings for thermometer bulbs was recommended. Experiments showed that such a form of covering would indicate higher temperatures than coverings of cotton waste, felt, wool, etc., besides being convenient to handle and of such compact form that the covering did not impede natural circulation over a large area of the surface under examination. Resistance measurements to determine internal temperatures often disagreed widely, the cold reading usually being the principal source of error. Such resistance methods should be limited to revolving parts, for they became particularly erroneous applied to stators, etc. For room temperature readings a metal cylinder inclosing the thermometer bulb was recommended. The actual method of determination, however, should depend on the kind of ventilation used.

In the consideration of the effect of different factors

upon temperature rise it was stated that a general tendency was noted toward higher rise at the cold-room temperature, but the inconsistency of other results made an accurate rule or statement inadvisable. However, from the curves and data presented in the paper, it was concluded that the present correction rule was wrong and should be corrected. The tests revealed the difficulty of formulating a rule to include all types of machines or even all parts of the same machine. Ultimate temperature reached was of greater importance than the rise noted, although further tests were desirable to fix a general statement to apply to temperature corrections.

Other tests which were reported showed that within commercial limits the temperature rise was independent of air temperature, provided nearby objects were at air temperature. In conclusion it was recommended that, contrary to the provision specified by the Standardization Rules, no correction be made for variation in air temperatures within the usual testing limits.

CURRENT RATING OF ELECTRIC CABLES

It was pointed out that the rating of an electric cable depended entirely upon its allowable heating, and this in turn was limited more by the external conditions than by particular features of the cable itself.

If carrying capacities of various cables were based on the time necessary for the cable to reach 90 per cent of its final temperature, it would require 50 per cent longer to attain 97 per cent of final temperature and 50 per cent less time to attain 68 per cent of final temperature. For nearly all conditions the carrying capacity of stranded cables varied as the 1.3 power of the diameter of the equivalent solid section.

Another paper pointed out that the carrying capacity of a cable may be computed with fair accuracy from observed data on the thermal resistivity of the insulation and the surface. In experiments the following heat-transmission values (in degrees Centigrade per watt per inch cube) had been found: rubber and cotton braid cover, 250; varnished cambric and cotton braid, 400; varnished cambric, lead-covered cables, 300. For surface resistivities (degrees Centigrade per watt per square inch): painted-steel braided armor, 100; cotton covering, 120; lead, ordinary, 190; lead, dull black, 140. Results showed that the effect on carrying capacity of surface resistance was much greater in general than the internal thermal resistance of the insulation. The surface losses thus became of great importance in determining cable-carrying capacities.

In the discussion E. D. Edmonston reported some effects observed in cable burn-outs at Baltimore where succeeding break-downs in adjacent cables at the same point were caused by globules of water distilled from the paper insulation at the time of the first break-down. He expressed hope that a more uniform set of cable specifications might be formulated through agreement of manufacturers and users.

H. M. Hobart declared his opinion that fog-laden or moist air offers a practical means of reducing the air volume to be circulated for cooling certain electrical machinery. There were, however, several practical details and problems which must be understood and solved before the use of moist air could be successful.

W. A. Durgin referred to the successful use of temperature or exploring coils on generators of from 5000 to 20,000 kw rating in Chicago. Close record was kept of internal temperatures and advance warning was given of clogging of the slots, indicating when cleaning was necessary.

Mr. L. W. Chubb reported that while nickel was an excellent material for temperature coils from the standpoint of its temperature coefficient, specific resistance, etc., it had the objectionable property of changing its electrical resistance when magnetized. One such exploring coil showed 2 per cent rise in resistance when the turbine field was excited.

THE "MYRIAWATT" AS A UNIT OF BOILER POWER

H. G. Stott opened Thursday morning's session with a discussion of the proposed use of the "myriawatt" and the "myriawatt-hour" as ratings of boiler power and performance. The speaker pointed out that the criticism to which this proposed unit had been subject was in general due to a misconception. At the present time the units of boiler power were not only arbitrary but based on many different definitions, including evaporation, heating surface, quantity of steam delivered, etc. The intention, he said, was not to introduce a new unit, but simply to add a multiple prefix to the familiar unit of power, thus making a convenient measure of the proper order of magnitude, corresponding in application to the kilowatt.

Dr. Steinmetz called attention to the heterogeneous and incompatible units employed in modern power-plant nomenclature, and the difficulty of making calculations or conversions through the various systems of units employed.

BRUSH FRICTION AND CONTACT LOSSES

H. T. Erben and A. H. Freeman called attention to the present insufficiency of A. I. E. E. rules on brush-loss determinations. These losses included both sliding friction and brush-contact drop, but the quantities involved were often too small for ordinary means of measurement. The variation in power required to drive the commutator at different temperatures was reported to be negligible.

Great variations were reported in brush-loss tests, even when made on slip-rings or special commutators, and such tests as usually carried out were virtually worthless for practical use. There was difficulty in separating actual brush loss from commutation loss. In parts of the brush current densities were found of three times the apparent average density. If local currents be eliminated by using narrower brushes, resistance leads or interpoles, higher average densities were permissible. Brush resistance decreased with increasing current, although at present no way of calculating or measuring the actual loss at the brushes was known.

SAFETY CAMPAIGN ON THE "WABASH VALLEY LINES"

The Fort Wayne & Northern Indiana Traction Company is putting forth an effort along various lines to make its city and interurban lines among the safest in the country. Safety committees have been organized covering the various divisions of the system. These division committees are located at Fort Wayne, one for the city lines and one for sections of the interurban divisions entering Fort Wayne, one at Boyd Park, one at Logansport and one at Lafayette. Each committee consists of a superintendent, as chairman, with representatives from the shops, power houses, section gangs, line gangs, dispatchers, station agents and trainmen. Matters relating to safety are reported on a form described later, and all employees are invited to make such reports. These reports as well as unsafe conditions which are brought in other ways to the attention of the committee are considered at the regular monthly meetings. A central safety committee, composed of all departmental heads and division chairmen, determines upon the general policy of the entire campaign.

The safety report slips above referred to and illustrated herewith are distributed so that any employee can notify the chairman of his committee of defects along the line. These blanks are so padded that each blank is made out in duplicate by means of a carbon paper. One slip is sent to the chairman of the central safety committee at Fort Wayne and the other to the local authority in charge of the defect reported. The latter, which is printed on yellow paper, is returned to the chairman of the central safety committee by the official whose duty it is to correct the defect, after the repair or recommendation has been made. This duplicate is then attached to the original blank in the office of the chairman of the central safety committee

so that that official always has before him a file of the defects which have been reported and have not been repaired, as well as of those which have been reported and have been repaired. After the duplicate blank has been returned to the chairman of the central safety committee with the statement that the defect has been corrected, a card is sent to the person making the original report of the

"WABASH VALLEY LINES"	
SAFETY FIRST	
M.	191...
..... Ind.	
Your report of 191... with regard to.....	
has been reported on by.....	
AND WE HOPE THAT THIS CONDITION OF DANGER WILL NOT ARISE IN THE FUTURE. We shall depend upon you to make report on this and other safety-matters in the future and the Company wishes to thank you at this time for the interest you have shown for the cause of SAFETY.	
THINK OF SAFETY AS FIRST.	
Chairman Central Safety Committee.	

Card Acknowledging Defect Report, Sent After Defect Has Been Remedied

defect. The blank used for this purpose is shown in the second engraving. This plan has been very successful.

The company is now holding a series of safety "rallies" to which the employees of the company and their families are invited. At these rallies an address is made on the subject of safety by an outside speaker brought in especially for the purpose. The first rally of this kind was held at Fort Wayne last month and was addressed by E. F. Schneider, general manager Cleveland, Southwestern & Columbus Railroad. The second meeting was held at Logansport with Charles B. Scott, formerly assistant to the general manager of the Louisville & Northern Railway & Lighting Company, as speaker. In addition to the address special music has been provided for each occasion. A third rally has been arranged for the Western division of the line at Lafayette, Ind. An effort has been made in each case to get the families of the employees into these meetings, and to do this special cars have been operated over the interurban lines for this purpose. The speaker delivers two talks at these rallies, one in the morning for the night men and one in the evening for the day men.

Another plan followed by the safety committee is the adoption of a "safety first" emblem and various mottoes relating to this subject. Some of these follow: "Attend a

STATE TIME AND EXACT LOCATION OF DEFECT (Use initials if necessary)	Wabash Valley Lines — "Safety First" — No 1484	
	Location Date 19...	
	Chairman Safety Committee. Ft. W. & N. I. T. Co.	
	Dear Sir—I desire to advise you of the following defects	
	
	
(To be filled in by authority in charge of defect.)		
Repairs have been made.	Same has been reported to	
Action or Recommendation	
Signed	Signed	
Always make out this report in duplicate. FIRST Copy to be sent directly to S. W. GREENLAND, Chairman Central Safety Committee, Ft. Wayne, Indiana. SECOND Copy to be sent to the local authority in charge of the defect reported. (over)		

Defect Slip, Filled Out by Employee and Sent to Chairman of Safety Committee

Safety Meeting and Get Acquainted," "Think of Safety First," "Start To-day to Save Life and Limb," "We Have Been Reporting to the Doctors—Let's Try the Safety Committees," "Get the Safety Habit—Set the Safety Example." These mottoes are also stamped on the service mail and envelopes so as to give wide publicity to them.

The chairman of the safety committee is S. W. Greenland, assistant to the general manager of the company. He is assisted by R. R. Ritchie, the supervisor of safety.

News of Electric Railways

New York Subway Operating Contracts Approved

The Public Service Commission of the First District of New York, on March 4, 1913, approved the contracts with the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company for the operation of the dual subway system, but did not act on the certificates for third-tracking the lines of the Manhattan Elevated Railway, which is operated under a lease by the Interborough Rapid Transit Company. The agreements are now before the Board of Estimate, and it is expected that they will be acted upon by that body within a few days. A difference of opinion has arisen between George J. Gould, president of the Manhattan Elevated Railway, representing stockholders of that company, and the officers of the Interborough Rapid Transit Company in regard to the certificates for third-tracking the lines of that company, and following a meeting of the directors of the Manhattan Elevated Railway on March 4, 1913, Edward T. Jeffrey, who presided, issued a statement to the effect that "while the company has no desire to interfere with the development of rapid transit, the contractual relations between the two companies must be determined on a fair and equitable basis." In March, 1908, the Public Service Commission approved the so-called tri-borough rapid transit system. In May, 1908, construction was ordered on the Fourth Avenue rapid transit line in Brooklyn. This work was subsequently postponed, only to be resumed later. In November, 1909, the constitutional amendment was adopted exempting dock and water bonds from the debt limit of the city so that additional credit could be secured for subway construction. In January, 1910, the Legislature enacted a law making available \$120,000,000 for subway construction. In October, 1910, the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company refused to bid on the tri-borough contracts. In June, 1911, the dual system plan was adopted in original form and construction was begun by the city on the Broadway-Lexington Avenue line. In May, 1912, the dual system operating agreements were submitted by the joint committee of the Public Service Commission and the Board of Estimate and Apportionment. A summary of the terms of the operating contracts as approved by the commission on March 4, 1913, follows:

The contract with the Interborough Rapid Transit Company provides that the city shall construct the new lines allotted to the Interborough company, and that the company shall contribute not less than \$58,000,000 (or one-half the total) toward the cost of construction, and not less than \$22,000,000 toward the cost of equipment. The company is to get a lease of all lines for operation, including the present subway and the new lines, for a term of forty-nine years from Jan. 1, 1917, the date set for the beginning of operation, and the lease is to expire at midnight on Dec. 31, 1965. Provision is made for temporary operation of parts of the system as soon as completed. The city reserves the right to take over any or all of the lines at any time after ten years and terminate the contract. The company is to supply all the equipment, and in the event of recapture the city is to pay for the equipment.

Arbitration is provided for in case difficulties arise between the city and the company. Each side is to name one arbitrator and the third is to be named by the Chief Judge of the Court of Appeals, or in his failure to act, by any of the associate judges of the Court of Appeals in order of seniority, or in their failure to act by the president of the Chamber of Commerce.

Provisions are made for securing to the city the necessary control over expenditures by the company in the construction, equipment, maintenance and operation of the lines. This control is provided because "the city's returns from its investment in the railroad and its exercise of its right to take over the railroad as provided in the lease will be affected by the amount of the lessee's expenditures." Supervision by the commission is agreed to and the company is required to provide facilities for such inspections as the commission may wish to make.

As to equipment, the contract requires that the company shall provide it at its own expense and, when accepted by the commission, title to it shall vest in the city. The company is permitted to improve, reconstruct or change its power houses if necessary to provide adequate power for the operation of the road.

The city leases the railroads and equipment to the company for operation in connection with the existing subway for a single fare. The lease under Contract No. 1 of the existing subway, which expires Oct. 27, 1954, and the lease under Contract No 2, which expires May 1, 1943, are modified and extended until midnight of Dec. 31, 1965, so that all leases may expire together. Receipts from all lines are to be pooled and at the end of each quarter certain specified deductions are to be made. The operating terms were referred to at length in the *ELECTRIC RAILWAY JOURNAL* of June 17, 1911, page 1070. Temporary operation to be on the same terms as are provided for the operation of extensions.

Free transfers are to be given as required and approved by the commission at common or connecting points. The company may carry freight, mail and express matter, provided that it does not interfere with the passenger service.

Provision is made for the temporary equipment and operation of the Steinway Tunnel pending its reconstruction and completion, and for the giving of free transfers at Forty-second Street and Park Avenue between the Steinway Tunnel and the subway. Temporary equipment may be of single cars, as approved by the commission, and the cost is to be included as part of the cost of equipment under the contract.

The operating contract with the Brooklyn Rapid Transit interests is made between the Public Service Commission, acting for the city, and the New York Municipal Railway Corporation, a company formed for the purpose of operating those parts of the dual system allotted to the Brooklyn company as well as the existing elevated lines of the Brooklyn Rapid Transit. It provides that the city shall construct the new lines of rapid transit railroad, and that the company shall contribute not less than \$13,500,000 toward the cost of construction, together with whatever sum is necessary to construct the physical connection at Canal Street between the Fourth Avenue subway and the proposed Broadway subway. The company also agrees to provide the money necessary for the reconstruction of its elevated lines and for all equipment.

The Brooklyn elevated lines which are made a part of the system are: the Broadway line, the Fulton Street line, the Myrtle Avenue line, the Lexington Avenue line, the Fifth Avenue line, the Brighton Beach line, the Canarsie line and the Sea Beach line. The city leases the new lines to be constructed by it and those already constructed, together with the equipment, to the company for operation in connection with the existing railroads for a term of forty-nine years, beginning on Jan. 1, 1917, and expiring at midnight on Dec. 31, 1965. The city reserves the right to take over any line after ten years of operation.

The city agrees to give to the company trackage rights over a part of the system to be constructed under the contract between the city and the Interborough Rapid Transit Company, namely, the Queens line to Astoria and Corona. The terms and conditions for the use of these lines "shall be reasonable and may be agreed upon between the commission, the lessee and the Interborough Rapid Transit Company." Failure to agree upon reasonable terms may bring about arbitration or a settlement by the courts. Such use of the tracks is limited to one-half the capacity of the lines.

Free transfers are to be given as required by the commission at common or connecting points so as to afford a continuous trip in the same general direction for a single fare. The company agrees to exchange transfers at Eighty-sixth Street, Brooklyn, between the new system and the existing surface railway now operating on Third Avenue and Fifth Avenue between Eighty-sixth Street and Fort Hamilton. The company also will endeavor to secure authority for the extension of such surface railroads to a point near Eighty-sixth Street and Fourth Avenue where

a more convenient point of transfer can be installed. The company also agrees to undertake to make arrangements with the Hudson & Manhattan Railroad for free transfers at Thirty-fourth Street, Manhattan, to and from the Grand Central Station.

The fare is limited to 5 cents, provided that the company may continue to charge 10 cents for the fare to Coney Island and other points where such 10-cent fare is now allowed "until the time when trains are operated for continuous trips over wholly connected portions of the railroad (including both the Culver line and subdivision 8 of the Broadway-Fourth Avenue line) from the Municipal Building, Manhattan, to the points at or near Coney Island at which the construction of the railroad shall be suspended."

Findings and Recommendations of the Pujo Committee

The Pujo committee's report and two bills embodying its recommendations were presented in the National House of Representatives on Feb. 28. The recommendations of a majority of the Pujo committee as regards clearing house associations cover incorporation and regulation, examination of members, the issuance of clearing house certificates, the regulation of rates for collecting out-of-town checks, the regulation of rates of discount and of interest on deposits. As regards the New York Stock Exchange, the recommendations cover conditions precedent to the use of the mails, the telegraph and the telephone. As regards the concentration of control of money and credit the recommendations cover the consolidation of banks, interlocking bank directors or directorates, interlocking stock holdings among banks, voting trusts in banks, cumulative voting, reform of railroad reorganization, etc. The sections in regard to the concentration of control of money and credit which relate to the railroads and railroad reorganizations follow:

"The method of reorganizing insolvent railroads should be reformed by adopting in substance the system provided by the companies act of Great Britain, whereby, briefly stated, the plan and procedure on reorganization are placed under the direction and control of the courts, the receiver is elected by the votes of those interested in the property, no sale is involved and a single shareholder can defeat an unjust plan.

"The Interstate Commerce Commission should be empowered, subject to review by the courts, to supervise and review plans for the reorganization of interstate railroads and the issue of securities thereunder.

"The security issues generally of interstate railroads should be placed under the supervision and control of the Interstate Commerce Commission.

"It should also be required that in the disposition of such issues competitive bids, public or private, be invited."

The committee has defined the so-called money trust as follows:

"An established and well-defined identity and community of interest between a few leaders of finance which has been created and is held together through stock holdings, interlocking directorates and other forms of domination over banks, trust companies, railroads, public service and industrial corporations, and which has resulted in a vast and growing concentration and control of money and credit in the hands of a comparatively few men."

In this connection it adds, however, that the so-called money trust has not proved to be "a combination or arrangement created and existing pursuant to a definite agreement between designated persons with the avowed and accomplished object of concentrating unto themselves the control of money and credit."

Proposal of City to Cincinnati Company

The proposition of the city of Cincinnati for the adjustment of street railway matters was submitted to the Cincinnati Traction Company and the Cincinnati Street Railway on Feb. 25 by City Solicitor Alfred Bettman. Two of the principal conditions are that the company shall surrender its fifty-year franchise and accept an indeterminate permit from the city and that it shall divide all profits above 6 per cent upon an appraised value of the property with the city. Other conditions are the privilege to the city of purchasing

the property, control of service and the virtual supervision of operations. The proposition provides for the lease and operation of the proposed loop line to be constructed by the city. This offer was made as a result of a conference between Mayor Hunt and City Solicitor Bettman on the one side and Governor Cox and Representative Bigelow on the other. The Governor and Representative Bigelow were consulted because a bill is now pending in the Legislature which would revoke all franchises which were drawn for more than twenty-five years and also because certain legislation will be needed to allow the city to construct the loop line and give it the privilege of building on some portions of the state canal lands in an open cut.

Representative Bigelow has expressed his disapproval of portions of this proposition. He claims they do not agree with the conditions settled upon at the conference mentioned. W. Kesley Schoepf, president of the Cincinnati Traction Company, said on Feb. 26 that the proposition contains several clauses which are not acceptable to the company.

Decision in Detroit Franchise Case

According to a decree entered by the Michigan Supreme Court on Feb. 28, 1913, the responsibility for ordering the vacation of Fort Street on which the franchise of the Detroit United Railway has expired is placed with the Detroit Council. Immediately following the decision of the Supreme Court on Oct. 12, 1912, to the effect that the company was a trespasser on Fort Street, attorneys for both the city and the company prepared decrees. The one entered by the court is practically the decree proposed by the company. By its terms the company must cease operating on Fort Street within ten days after the Council has so ordered. Attorneys for the city hoped that the decree would contain an order commanding the company to cease operation on that thoroughfare ten days from the date of entry, and their proposed decree was so formulated. F. W. Brooks, general manager of the company, was quoted as follows:

"The management of the Detroit United Railway has no criticism or comment to make concerning the decision of the Supreme Court. No official notification of the decision has been received at this office, but when it comes the order of the court will be obeyed."

Mayor Marx and members of the City Council of Detroit, Mich., have been investigating the advisability of establishing a municipal motor bus line for the accommodation of West End people. The Mayor states that if the Detroit United Railway will build a crosstown line on Junction Avenue, the bus line will not be necessary.

Ross W. Harris, Madison, Wis., has conferred with the Mayor in regard to street railway matters and has agreed to put into writing his proposals for a study of traffic conditions in Detroit similar to that which he carried out recently in Cincinnati, Ohio.

Rapid Transit Measures for Philadelphia

A number of measures have been drafted at the instance of Mayor Blankenburg of Philadelphia for introduction into the Legislature at Harrisburg which it is believed will benefit the city materially in handling its transit situation and make possible the building of subways and elevated lines. One of the measures is so drawn as to authorize the city to construct or lease subway and elevated roads with broad powers of eminent domain within and without the city limits. In another of the proposed laws, the assessed value of taxable personal property tax would become part of the basis of assessments on which the city's borrowing capacity is computed and would therefore increase such borrowing capacity at this time by about \$40,000,000, while the city's revenues would be increased at the same time annually by more than \$650,000. Another bill provides for the creation of a department of city transit by amendment to the Bullitt bill. The department of city transit would be in the charge of a director to be appointed in the same manner as the directors of other city departments, and the head of the department of city transit would be empowered to appoint an assistant director and such officers, clerks, engineers and other employees as were found necessary. The act also provides an appropriation by Coun-

cils of the fund necessary for the maintenance and operation of the department. Director Cook of the department of public safety is reported to have said:

"While Transit Commissioner A. Merritt Taylor has been absent during a part of the time while these bills were under consideration they follow out in essential details his ideas, and to him belongs a very large share of the credit for the plan."

Railroad Starts Electrical Correspondence School

A free course of correspondence study in electrical engineering and associated subjects has been inaugurated by the Pennsylvania Railroad under the supervision of J. C. Johnson, superintendent of telegraphs. Although the plan was announced only a little more than a month ago, the school already has more than 10,000 students enrolled.

The course of study will consist of a series of instruction papers in pamphlet form, each covering a different field and including elementary work on direct-current and alternating-current circuit and apparatus; mathematics, mechanical and geometrical drawing; magnetism and its application to electric generators, motors, measuring instruments, telegraph, telephone, signal, lighting, traction and general electrical equipment; every-day troubles developing in each type of apparatus, and methods of locating and correcting them.

Besides providing a means for the education of its employees in existing applications of electricity, it is understood that the company has adopted this method to train the largest possible number of its men for the duties that will devolve upon them when electric traction is substituted for steam locomotive haulage. Students are invited to ask questions, and a course of supplementary reading of text-books and periodicals is recommended.

The first textbook in the educational course is elementary arithmetic, followed by pamphlets on primary cells and direct current. Fourteen of these pamphlets, concluding with electric traction and power plant design and apparatus, will complete the course.

New Steel Bridge at New London

Engineers of the New York, New Haven & Hartford Railroad are completing the plans for the new steel bridge over the Thames River at New London, Conn. The plans call for a four-track bridge, consisting of two double-track parallel spans. The height of the bridge above the bottom of the channel will be 140 ft. There are to be five fixed spans, four of which will be of 195 ft. each and one of 245 ft., and also one draw span having a clear channel of 150 ft. It is estimated that, including certain sections of the approaches, the total cost will be about \$4,000,000. The present structure was offered to New London for highway purposes, but this offer was refused. It was subsequently offered to the State of Connecticut as a feature of its highway program, and a bill has been introduced in the Connecticut Legislature providing for the acceptance of this offer. The only reservation made by the New York, New Haven & Hartford Railroad is that the company may have permission to run an electric railway over the old bridge should it be deemed advisable.

License Fee Increase Proposed in Harrisburg.—An ordinance has been introduced in the City Council of Harrisburg, Pa., to increase the annual license fee charged the Valley Railways from \$500 to \$1,500.

Tacoma Votes to Build Municipal Line.—The City Council of Tacoma, Wash., has voted to build a municipal electric railway from Eleventh and A Streets over the new Eleventh Street bridge and the tide flats to the city limits at Sitkum Avenue.

Study of Transit Needs in Montreal.—The comptrollers of the city of Montreal have been requested to study the question of the city constructing a system of underground tramways. The report of the committee of the Aldermen on reducing the number of street car stops in Montreal has been sent to the comptrollers. John P. Fox has begun an investigation of street railway problems in Montreal for the city.

Buffalo Improvements Illustrated.—The *Buffalo Times*, which issues with its Sunday edition an illustrated supple-

ment, published on Feb. 23, 1913, an exterior view of the new Fillmore Street substation of the International Railway and a view showing a portion of the interior of the new Broadway substation of the company. Underneath the pictures appeared the caption, "Improvements Being Made in the Equipment of the Buffalo Street Car System."

Rehabilitation Work at Toledo.—The annual meetings of the subsidiary companies of the Toledo Traction, Light & Power Company, Toledo, Ohio, have been further postponed. At a meeting of the officials of the city and the officers of the company recently it was announced that \$1,000,000 will be spent in improvements. A resolution has been adopted by the City Council asking that one of the lines be completely equipped with pay-as-you-enter cars.

Ordinance Based on Recommendations of St. Louis Commission.—An ordinance has been introduced in the Council of St. Louis, Mo., to require the United Railways to expend about \$2,000,000 in additions and improvements. The ordinance is based on the recommendation of the Public Service Commission of St. Louis that the United Railways purchase 165 motor cars at \$6,500 each, 165 trail cars at \$3,500 each, and spend \$150,000 in the construction of extra loops.

Mayor Blankenburg Agrees to Car Trust Plan.—Mayor Blankenburg of Philadelphia, Pa., has signed the ordinance authorizing the Philadelphia (Pa.) Rapid Transit Company to issue car-trust certificates to the amount of \$4,200,000 and in the future to make additional issues, provided that such issues shall not exceed 80 per cent of the cost of the cars. The authorization of the issuance of the car-trust certificates by both branches of Councils of Philadelphia and by the stockholders of the Union Traction Company, Philadelphia, was referred to in the *ELECTRIC RAILWAY JOURNAL* of March 1, 1913, page 389.

Get-Together Dinner in New York.—The second annual beefsteak dinner and reunion of the car equipment departments of the Interborough Rapid Transit Company and the New York Railways was held recently at Healy's. Messrs. Fuhrer, Delaney, Dougan and other officials of the company attended. Among the representatives of the different supply companies were numbered Messrs. Scott, Carter and Moore, of the General Electric Company; Shepard and Keller, of the Westinghouse Company; Hall, of the Yale & Towne Manufacturing Company; King, of the Sterling Varnish Company, and others too numerous to mention.

Additional Block Signal Protection on Illinois Traction System.—As a part of the construction schedule for 1913, the Illinois Traction System will block solidly the territory between Springfield and St. Louis during the coming summer. The total distance is approximately 100 miles, 35 of which were protected in 1911. To fill in the gaps will require approximately 60 miles of additional protected track. The type of signal used in the original installation was the Union Switch & Signal Company's style B with home and distant signals protecting each siding. The new arrangement of signals and type of apparatus will be practically identical with that now in service.

Committee on Dispatching Appointed by Wisconsin Association.—The Wisconsin Electrical Association has appointed a committee on train dispatching. The purpose of the committee is to recommend to the Railroad Commission of Wisconsin a uniform system of train dispatching practicable for all of the interurban electric railways of the State. Following are the members of the committee: E. W. Hammett, chairman, superintendent of the railway department of the Sheboygan Railway & Electric Company; John St. John, assistant general manager of the Milwaukee Northern Railway, and A. E. Pierce, assistant general manager of the Chippewa Valley Railway, Light & Power Company.

Plans for Extension of San Francisco Municipal Line to Exposition.—The Board of Supervisors of San Francisco, Cal., has adopted a resolution requesting the Board of Public Works to submit a preliminary plan with approximate estimate of cost of an adequate municipal street railway system to the site of the Panama-Pacific Exposition. The board was urged to complete its preliminary report as soon as possible and to advise the supervisors in regard to the

time that will probably be required to build and equip such lines as may be embraced in the plans suggested. A resolution calling upon the United Railroads to put into immediate service 100 additional cars has been referred to the public utilities committee for investigation and report.

Plans of Stone & Webster in the Pacific Northwest.—Stone & Webster, Boston, Mass., have under consideration the construction of an electric railway from Bellingham to Lynden with a possible extension to Vancouver, B. C., and the construction of power plants to develop between 100,000 hp and 200,000 hp on the sites purchased recently from the Skagit Power Company. Jacob Furth, president of the Puget Sound Traction, Light & Power Company, Seattle, Wash., is quoted as follows: "We are now surveying and measuring the streams and investigating. From the knowledge we have already gathered the prospects are bright for the ultimate completion of a plant on those sites that will give us from 100,000 hp to 200,000 hp, and everyone knows what the development of so much power will mean to the surrounding country and cities. Such projects move slowly, of necessity. We began building our White River power plant over two years ago and it is not finished yet. There is much to do before we can begin construction on this big Skagit plant."

LEGISLATION AFFECTING ELECTRIC RAILWAYS

ILLINOIS

Representative Ryan has introduced into the Legislature a bill to limit to ten hours per day employment of conductors or motormen on street cars and interurban lines. Senator Cornwell has introduced Senate Bill No. 169, which is a substitute for his first bill to require all interurban railways to provide toilet facilities and drinking water on all cars. The revised bill provides that not only the Railroad and Warehouse Commission but any public prosecutor may prosecute those who violate the provisions of the act as amended.

MASSACHUSETTS

A hearing was held before the committee on street railways on Feb. 27 upon the bill to authorize street railways to purchase the whole or part of connecting lines in other states. Bentley W. Warren, counsel for the Massachusetts Street Railway Association, appeared in support of the measure. There was no opposition. Charles F. Baker, for the Fitchburg & Leominster Street Railway, appeared in support of the bill to authorize street railways to fund indebtedness to an amount equal to but not exceeding twice the value of their capital stock. He explained that the bill is designed to relieve companies from carrying short-term notes, which is highly expensive, but necessary under the present law limiting the bonded indebtedness to the same amount as the capital stock.

The Boston Transit Commission has issued a report regarding the construction of a subway for train service extending from Andrew Square, Dorchester, to Codman Square, a distance of about 2.8 miles, in accordance with a resolve of the last Legislature directing the board to compare routes between the above points. The commission recommends a route via Upham's Corner, and the estimated cost of construction of the line is \$6,300,000, exclusive of land damages.

MICHIGAN

The Verdier home rule bill was passed by the Senate on Feb. 27, but it was held for further consideration in the committee on city corporations of the House. The supporters of municipal ownership in Detroit urged haste so that they may prepare amendments to the city charter in time for a vote at the regular April election. The bill has been amended so that ordinances proposing a revision of parts of the city charter may lie on the table fifteen instead of thirty days before the election. Another amendment increases the amount of bonds that a city may issue from 1 to 2 per cent of the assessed valuation of the city. That will give Detroit an opportunity to issue \$10,000,000 of bonds instead of half that amount, as provided in the original draft. An amendment was appended increasing from 5 per cent to 10 per cent the number of electors voting for Mayor at the last election who must sign the initiatory petitions.

MINNESOTA

The Nolan public utility bill, which has been passed by the House, was recommended on Feb. 20, 1913, for passage in the Senate by the committee on corporations other than municipal, with an amendment exempting telephone companies. This bill does not provide for a public utilities commission, but delegates to all cities and towns the power to regulate the rates of public utility corporations, telephone companies being excepted.

MISSOURI

The Senate has passed the public utilities bill by a vote of 26 to 5, and the measure is now before the Governor for his signature. The bill is an administration measure and provides for the creation of a commission to have supervision over the activities of all the public service corporations which operate in the State.

NEW YORK

Senator Thomas O'Keefe, of Oyster Bay, has introduced a bill to place the counties of Nassau and Suffolk under the jurisdiction of the Public Service Commission for the First District instead of the Commission for the Second District. The bill also provides that the number of commissioners in the First District (New York City) shall be six instead of five and that the additional member shall be a resident of either Nassau or Suffolk County.

On Jan. 25, 1913, the judiciary committee of the Assembly voted to report favorably Assemblyman Goldberg's bill, patterned after the Kansas "blue sky" law and designed to regulate all investment companies.

OHIO

A hearing on the bill to repeal the law requiring consents of property owners abutting any proposed street railway was held before the committee on cities of the House on Feb. 20. City Solicitor Bettman of Cincinnati, City Solicitor David Jenkins of Youngstown, Mayor Newton D. Baker of Cleveland, Secretary Walter Draper of the Cincinnati Traction Company and others spoke in favor of the bill. There was no opposition. The bill was approved later by the committee.

Representative Walter G. Alger has introduced a bill giving the commissioners of Stark County authority to bring suits for the termination of franchises of electric railways where the date of expiration is not given. A bill has been introduced by Representative Vollmer, of Cuyahoga County, which makes it unlawful for an employer to discriminate against union or non-union men. Employers are forbidden to keep a record of employees' qualifications for the purpose of giving information to other employers as to their worth.

The Kilrain bill requires street railways to furnish seats for conductors on duty in pay-as-you-enter cars. Representative Black has introduced a bill which permits any interurban railway which seeks to connect two municipalities to secure an entrance to either or both of such municipalities. At present a company must have 10 miles of track laid before it can do this. Representative Louis Capelle has offered two bills which seek to establish the principle that proof of injury of any passenger or employee of a steam railroad or electric railway should be *prima facie* evidence of lack of reasonable skill or care on the part of the company's servants.

The Green workmen's compulsory compensation bill has been passed by both branches of the Legislature. It provides that all individuals, firms or corporations employing five or more persons regularly shall contribute to the State fund or make provisions to compensate their employees directly or through a mutual organization made up of a number of employers. Liability companies proper are practically barred from doing this class of business. The act goes into effect on Jan. 1, 1914.

A bill has been introduced which provides that electric railways shall carry all policemen and firemen free. Representative Plumb, of Delaware County, has introduced a bill in the House which will give the Columbus, Urbana & Western Traction Company the right-of-way over the grounds of the Girls' Industrial School, near Delaware. A bill to permit municipalities to levy special assessments on street railways to pay for street improvements has been introduced by Representative Williams.

PENNSYLVANIA

The hearing before the judiciary committee of the House on the public utility bills was originally scheduled for Jan. 26, but a postponement was voted. Requests for information covering the bills have been so numerous that authority has been granted for printing 500 additional copies of each bill. It is expected that it will take ten days to dispose of this bill. It is believed that the committee will recommend a bill combining features of the Republican, the Democratic and the administration measures and that the bill so recommended will pass both branches without material changes. Should this prove to be the case, Governor Tener will probably sign the measure as he is pledged to a public utility law.

One of the eleven bills introduced in the House at the request of Mayor Magee of Pittsburgh empowers that city to construct and operate electric railways within the corporate limits of the city. The Clark bill providing a commission form of government for third-class cities like Harrisburg has been reported affirmatively from the Senate committee with an amendment providing that public service corporation franchises may be granted by the commissioners on condition that a certain period elapse before said grant becomes operative, during which a referendum petition bearing the signatures of 15 per cent of the electors may be filed. The bill as originally presented prohibited the granting of franchises without a referendum vote. The general appropriation bill has been introduced in the House. It carries \$42,662,343. The State Railroad Commission requests \$194,000.

WASHINGTON

House Bill No. 255, before the Senate and House irrigation and arid land committees, has caused a great deal of comment throughout the State of Washington. The measure provides that waters or streams in the State necessary for irrigation cannot be used for the generation of electric power to be sold to other states. The primary object of the measure is to prevent the Northwest Electric Company from proceeding with its operations on the Klickitat River in Klickitat County. This company is damming the stream and erecting power houses and expending several millions of dollars.

WISCONSIN

Further railroad commission legislation is provided for in a bill to punish for failure to comply with the order of the commission. A bill to require street railways to pay for street pavements between the rails of their tracks and 1 ft. on the outside thereof has been introduced in the House. Another measure provides for reasonable wages and salaries to employees of public utilities. A measure providing that cities of the first class may extend water mains on public highways or tunnel under steam and electric railway crossings and another authorizing cities to sell tracks for street railways laid by cities and along bridges and viaducts within such cities have been introduced in the Legislature.

PROGRAM OF ASSOCIATION MEETING

American Society of Mechanical Engineers

The railway committee of the American Society of Mechanical Engineers has arranged for the discussion of the subject of steel passenger car design in its various phases at a meeting to be held in the Engineering Societies Building, New York, N. Y., on the evening of April 8. Various phases of the subject will be discussed as follows: "Problem of Steel Car Design," "Suspension of Steel Cars," "Truck for Steel Passenger Cars," "Provision for Electric Lighting in Steel Cars," "Provision for Electrical Equipment on Steel Motor Cars," "Special Ends for Steel Passenger Cars," "Draft Gears for Steel Passenger Cars," "Cast-Steel Double-Body Bolster and End Frames for Steel Cars," "Superstructure of Steel Cars," "Roof Structure for Steel Cars," "Interior Steel Finish for Steel Passenger Cars," "Corrosion and Protection of Steel Passenger Cars," "Air Brakes and Heavy Steel Passenger Cars and Special Pressed-Steel Shapes for Steel Cars." The chairman of the railway committee is E. B. Katte, chief engineer of electric traction of the New York Central & Hudson River Railroad.

Financial and Corporate

Stock and Money Markets

March 5, 1913.

Trading on the New York Stock Exchange was more active to-day than yesterday, and the upward movement of the market was resumed. Nearly all of the important railroads and industrials advanced from 1 point to more than 2 points, while a number of the specialties made even greater gains. For the most part comment on the new Cabinet was favorable, and little or no concern was felt over the tone of the President's inaugural address. Call money became still easier to-day. Rates in the money market were: Call, 2 3/4 @ 3 1/2 per cent, with the last loan at 2 3/4 per cent; sixty and ninety days, 4 1/2 @ 4 3/4 per cent; four months, 4 3/4 per cent; five and six months, 4 1/2 @ 4 3/4 per cent.

In the Philadelphia market to-day only a light demand was evident on the Exchange, and trading continued on a small scale.

In the Chicago market to-day a strong tone was shown generally throughout the entire list. Bonds were steady.

The tone which the market took to-day in Boston was considered distinctly better, but the market was narrow.

Prices were steady on the Baltimore Exchange to-day, but the trading continued dull.

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

	Feb. 26.	Mar. 5.
American Brake Shoe & Foundry (common).....	90 1/2	90 1/2
American Brake Shoe & Foundry (preferred).....	130 1/2	131 1/2
American Cities Company (common).....	47 1/2	47 1/2
American Cities Company (preferred).....	75 3/4	76 1/2
American Light & Traction Company (common).....	390	380
American Light & Traction Company (preferred).....	108	107
American Railways Company.....	40	39 3/4
Aurora, Elgin & Chicago Railroad (common).....	43	44
Aurora, Elgin & Chicago Railroad (preferred).....	85 3/4	86 1/2
Boston Elevated Railway.....	108	108 1/2
Boston Suburban Electric Companies (common).....	7 1/2	7 1/2
Boston Suburban Electric Companies (preferred).....	65	65
Boston & Worcester Electric Companies (common).....	5 1/2	6
Boston & Worcester Electric Companies (preferred).....	43	40
Brooklyn Rapid Transit Company.....	88 1/4	90 5/8
Capital Traction Company, Washington.....	122 3/4	120
Chicago City Railways.....	150	150
Chicago Elevated Railways (common).....	30	30
Chicago Elevated Railways (preferred).....	91	91
Chicago Railways, ptcptg., ctf. 1.....	92	90
Chicago Railways, ptcptg., ctf. 2.....	23 1/4	24
Chicago Railways, ptcptg., ctf. 3.....	6 1/2	6 1/2
Chicago Railways, ptcptg., ctf. 4.....	3 1/2	3 1/2
Cincinnati Street Railway.....	111	111
Cleveland Southwestern & Columbus Ry. (common)...	6	*6
Cleveland Southwestern & Columbus Ry. (preferred)...	30	*30
Cleveland Railway.....	103 1/2	103 1/4
Columbus Railway & Light Company.....	18	18
Columbus Railway (common).....	69	69
Columbus Railway (preferred).....	88 1/2	88 1/2
Denver & Northwestern Railway.....	117	117
Detroit United Railway.....	76	85
General Electric Company.....	137 1/2	139
Georgia Railway & Electric Company (common).....	a123	122
Georgia Railway & Electric Company (preferred).....	83 1/2	84
Interborough Metropolitan Company (common).....	17	18
Interborough Metropolitan Company (preferred).....	57 1/2	61 1/2
International Traction Company (common).....	42	42
International Traction Company (preferred).....	95	95
Kansas City Railway & Light Company (common).....	20	20
Kansas City Railway & Light Company (preferred)...	38	38
Lake Shore Electric Railway (common).....	6 1/2	6 1/2
Lake Shore Electric Railway (1st preferred).....	91	91
Lake Shore Electric Railway (2d preferred).....	25 1/2	25 1/2
Manhattan Railway.....	132 1/2	131
Massachusetts Electric Companies (common).....	16 1/2	16 7/8
Massachusetts Electric Companies (preferred).....	76	75 3/4
Milwaukee Electric Railway & Light Co. (preferred)...	102	102
Norfolk Railway & Light Company.....	*26	*26
North American Company.....	77 1/2	79
Northern Ohio Light & Traction Company (common)...	80	75
Northern Ohio Light & Traction Company (preferred)...	105	105
Philadelphia Company, Pittsburgh (common).....	45	46
Philadelphia Company, Pittsburgh (preferred).....	40 1/2	41
Philadelphia Rapid Transit Company.....	25	25 5/8
Portland Railway, Light & Power Company.....	67	67
Public Service Corporation.....	115	115
Third Avenue Railway, New York.....	35 1/2	37 1/2
Toledo Railways & Light Company.....	2 1/4	2 1/2
Twin City Rapid Transit Co., Minneapolis (common)...	104 1/2	106
Union Traction Company of Indiana (common).....	*4 1/2	*4 1/2
Union Traction Company of Indiana (1st preferred)...	*81	*81
Union Traction Company of Indiana (2d preferred)...	*34	*34
United Rys. & Electric Company (Baltimore).....	23 3/4	*23 1/4
United Rys. Inv. Company (common).....	24	27 1/2
United Rys. Inv. Company (preferred).....	49 1/2	51 7/8
Virginia Railway & Power Company (common).....	55 1/2	54
Virginia Railway & Power Company (preferred).....	92 1/2	92 1/2
Washington Ry. & Electric Company (common).....	84 1/4	84
Washington Ry. & Electric Company (preferred).....	87 3/4	88 1/4
West End Street Railway, Boston (common).....	77	78
West End Street Railway, Boston (preferred).....	97	*97
Westinghouse Elec. & Mfg. Company.....	69 1/2	70 1/2
Westinghouse Elec. & Mfg. Company (1st preferred)...	115	118

*Last sale. a Asked.

ANNUAL REPORT

Cleveland Railway

The gross income of the Cleveland Railway in the calendar year 1912 amounted to \$6,679,773. Expenses of maintenance and operation were \$4,935,574, taxes were \$366,591 and interest was \$1,416,543, a total of \$6,718,708. This left a deficit of \$38,935. The increase in passenger revenue as compared with the preceding year was 4.59 per cent and in gross income it was 3.99 per cent. The increase in the number of fares was 7.45 per cent and in the total transfers 16.51 per cent. Passenger car miles were 28,864,296, or 3.64 per cent greater than in the preceding year.

The statement of income account for 1912, as based on the ordinance allowance and on actual disbursements, shows the following:

	Based on Disbursements		Based on Ordinance Allowance	
	Amount	Cents per Mile	Amount	Cents per Mile
Operating revenue	\$6,648,756	22.84	\$6,648,755	22.84
Actual expenses	4,935,574	16.96		
Expense allowances			4,786,220	16.44
Net earnings from operation.....	\$1,713,182	5.88	\$1,862,535	6.40
Miscellaneous income	31,016	.11	31,017	.11
Gross income, less disburse. or allow..	\$1,744,198	5.99	\$1,893,552	6.51
Taxes	366,591	1.26	366,591	1.26
Net income	\$1,377,607	4.73	\$1,526,961	5.25
Interest	1,416,542	4.87	1,416,543	4.87
Deficit	\$38,935	.14		
Surplus			\$110,418	.38

John J. Stanley, the president, says in the report in part:

"The total cost of operation per revenue car mile, including maintenance charges, operating expenses, taxes and interest, was 23.09 cents; the gross income per car mile was 22.95 cents, a deficit of 0.14 cent.

"The maintenance and operating expenses of the year were 16.96 cents per car mile; the ordinance allowances were 16.44 cents per car mile, a difference of about half a cent.

"Maintenance and operating expenses exceeded the ordinance allowances of the year by \$149,353.

"In January, 1912, the company asked the City Council to increase the allowances one-half cent per car mile, but the request was refused. Another application will be presented to the Council.

"The rate of fare throughout the year was 3 cents within the city limits. In 1911 the rate was 3 cents in the last seven months of the year and 3 cents plus 1 cent for a transfer in the first five months.

"The average fare in 1911, including suburban fares, was 3.247 cents; in 1912 3.18 cents.

"The City Street Railroad Commissioner has been active throughout the year in connection with plans for lessening the cost of operation, or improving the service without a corresponding increase in expenses, and for certain improvements in the way of extensions of track, principally for cross-town lines and additional loops down-town and at various points near factories on several of the company's lines. By the amendments of the Tayler franchise, adopted by the Council in 1911 and accepted by the company, the city obtained the right to propose extensions, betterments and permanent improvements, and the company obligated itself to construct or otherwise acquire such improvements. These in 1912 have consisted mainly of additional trail-cars, a few additional motor equipments and the extensions of track and construction of loops just mentioned.

"The principal efforts of the Commissioner to decrease the cost of operation per car mile have been in the direction of

"1. Eliminating car stops, in order that cars may be operated between the down-town loops and the outer termini of the lines in shorter time.

"2. Restoring trail-car operation.

"3. Re-arranging the down-town loops, in order to relieve congestion in and near the Public Square.

"4. Cutting the two through lines, Woodland-Lorain and Scovill-West Twenty-fifth, at the Public Square. This change does not lessen the number of cars on the down-town loops, but it has increased the number of transfers,

and will increase the earnings if the fare is raised to the next rate provided for by the franchise, viz., 3 cents cash fare, 1 cent transfer, no rebate.

"In the Tayler franchise the city reserves the entire control of the service to be furnished by the company, including the right to determine the character of the cars. Under this provision it directed the purchase of 100 large trail-cars of a new design, of which 95 have been put in service mornings and evenings. Under direction of the city we have contracted since the close of the year for 100 additional trailers of substantially the same type and 51 additional motor cars with electrical equipments.

"Recognizing the city's right to propose betterments and to prescribe schedules, routes and the character of cars to be used, your directors and officers have complied with all the demands of the Council and the Commissioner in these respects. The relations of the company with the city have, therefore, been harmonious during the entire year.

"These changes in methods of operation, which have undoubtedly lessened the cost per car mile and per passenger, could not have been made without the consent and co-operation of the city.

"The federal census of 1910 showed that the population of Cleveland had increased 47 per cent in the decade between 1900 and that year, or about 4 per cent per year compounded. The best statistics available indicate that this rate of growth has continued since 1910, if indeed the percentage in the last two years has not been larger. The business of the company, measured not in dollars but in the number of fares collected, has more than kept pace with this growth, and is one of the best indications of the growth. And Cleveland's principal suburbs are growing faster than Cleveland itself.

"The increase in service over 1911, measured in car miles, making allowance for increase in the size of cars, has not kept pace either with the increase in fares or the growth of the city and its suburbs, having been but 3.64 per cent, while the number of fares increased 7.45 per cent and the number of rides 9.56 per cent.

"The number of rides per car mile in 1911 was 9.409, in 1912 9.946.

"These figures indicate that the service ought to be improved. The cars that have been ordered will, when delivered to the company, enable us materially to better it.

"To operate the additional cars more power had to be provided. Early in 1912 the company, after long and careful negotiations, in which the City Street Railroad Commissioner participated, and in which he had the advice of some of the best engineers in the country, a contract was made with the Cleveland Electric Illuminating Company for the purchase of power, your officers and the Commissioner believing that it would be more economical to purchase current than to erect and equip additional generating plants. Power-plant expenses in 1913 will show an increase over 1912 because they will include in the amounts paid to the illuminating company what would be paid by the railway company in interest on additional investment if it should construct its own power plants, and no interest has heretofore been included in operating expense accounts.

"To enable the illuminating company to deliver its current to us we agreed to build and equip four substations.

"In February, 1912, we agreed with the North Randall Railway Company to operate an electric railroad to be built by that company from the terminus of our Broadway line on Miles Avenue to the North Randall race track and fair grounds. The line is about 3½ miles in length and was opened for operation July 29, 1912. The contract provides that we are to operate our own cars over it, and the North Randall Railway Company agrees to guarantee us against loss and has given us a bond with sufficient surety to carry out this agreement. This company is to receive, as a part of the cost of operation, 6 per cent upon the value of all property necessary for the operation of the railroad. No loss can come, therefore, to you under this contract. After payment of all expenses, including interest, the surplus earnings, if any, are to be equally divided between the two companies.

"The earnings of the new road to Jan. 1 amounted to \$5,179, or 21.42 cents per car mile.

"On Dec. 14 the Council of Cleveland passed an ordinance giving the company the right to transport freight

within the city limits in interurban cars, and to charge the interurban companies for such transportation 25 cents per car mile, a sum somewhat in excess of the company's other earnings. The company is to have the right to fix the compensation in the last fifteen years of its Cleveland franchise or any renewal of it. No freight has yet been carried under this grant. The franchise was passed at the urgent request of the merchants of the city. Some objection is made to the company doing a freight business, and it may be that a referendum election on the ordinance will be demanded.

"The company has erected in all of its car yards, except its Denison Avenue yard and its Holmden Avenue yard, both of which will probably be abandoned within a short time, standpipes equipped with monitor nozzles so distributed that two strong streams of water may be turned upon any car in the yard to extinguish or hold in check any fire that may start. It has equipped with automatic sprinklers buildings not previously so protected.

"The result of these improvements has been to reduce rates of insurance and insure greater safety to the company's rolling stock. Its equipment is not adequate for the service demanded by the community, and it cannot afford to lose any of it by fire.

"In July the directors authorized the sale to the stockholders of additional capital stock at par to an amount equal to 20 per cent of the \$15,074,600 then outstanding. Substantially all this stock was taken by the stockholders and has been paid for.

"Proceeds of the sale of this stock have been used to pay for betterments and to take up a floating indebtedness of \$407,000. After the betterments authorized have been completed and paid for about \$1,400,000 was left to be applied to the payment of the Cleveland Electric Railway Company's bonds maturing on March 1. To pay the rest of these bonds and the cost of cars, motors and other betterments to be provided in 1913, your directors, instead of selling additional bonds of the issue of March 1, 1911, authorized another offer of stock, at par and interest."

Extensions of track aggregating 1.52 miles were built in 1912. Tracks aggregating 14.42 miles were renewed.

The balance in the interest fund on Dec. 31, 1912, was \$484,283, or \$15,717 less than the amount placed in the fund originally under the provisions of the Tayler ordinance. In 1910 and 1912 profits—that is to say, earnings in excess of allowances, taxes and interest—were added to the fund, as follows: In 1910, \$75,994; in 1912, \$110,418. In 1911 there was a loss after provision for allowances, taxes and interest of \$202,129. This makes the net loss for the three years \$15,717.

The expenditures for betterments in 1912 amounted to \$961,341.

A statement of the maintenance and operating reserves follows:

	Amounts	Cents per Car Mile
Maintenance Reserve:		
Allowance	\$1,438,662	4.94
Expenses	1,387,427	4.77
Surplus	\$51,235	.17
Operating Reserves:		
Allowance	\$3,347,558	11.50
Expenses	3,548,147	12.19
Deficit	\$200,589	.69
Maintenance and Operating Reserves:		
Allowances	\$4,786,220	16.44
Expenses	4,935,574	16.96
Deficit	\$149,354	.52
Operating deficit	\$200,589	.69
Maintenance surplus	51,235	.17
Net deficit for year	\$149,354	.52

A statement showing the cost and income in 1912 per car mile, per fare and per ride follows:

	Cents		
	Per Car Mile	Per Fare	Per Ride
Maintenance expenses	4.77	.6823	.483
Operating expenses	12.19	1.7448	1.236
Taxes	1.26	.1803	.128
Interest on funded and floating debt	1.76	.2515	.178
Interest on capital stock	3.11	.4451	.315
Total cost of operation	23.09	3.3040	2.340
Gross income	22.95	3.2849	2.327
Deficit14	.0191	.013

San Francisco Note Plan Defended

Thornwell Mullally, assistant to the president of the United Railroads of San Francisco, has issued a statement explaining in detail the position of the company in connection with its plan for the issue of notes. As stated in the issue of this paper for Feb. 22, 1913, the Railroad Commission of California denied the application of the company for approval of the issue of notes. Mr. Mullally said in part in his statement:

"It is true that the company reduced its common capital stock. The company, on account of the terrible disaster of the earthquake and fire in 1906, had suffered a reduction in the value of its properties. As a result of this the company, in December, 1908, voluntarily reduced its capitalization \$1,200,000, which represented a part of the actual losses suffered from the earthquake and fire.

"If capital stock is carried on the balance sheet under the head of 'liabilities,' a reduction of the stock would reduce those 'liabilities' in a corresponding amount and would increase the profit and loss surplus in a corresponding amount. This is the natural and proper result. Such an increase in the profit and loss surplus would not be false. It would be consequent upon the reduction of the capitalization. It would be actual and real and a false surplus would not thereby be set up.

"Of course, 'if' out of a false surplus a dividend is paid it is improper and illegal. The commission merely states a supposititious case. It does not here and could not correctly state that dividends have been paid out of a false surplus. The conditional statement has no application to the case in point, because the United Railroads has not set up any such false surplus and therefore it has not and could not have paid the dividend out of it. As a matter of fact the dividend was paid out of net surplus earnings.

"The practice of the applicant in regard to the system of bookkeeping under which its entries concerning sinking funds are made was installed by the certified public accountants, Haskins & Sells, and is one adopted by the leading certified public accountants generally throughout this country. If the auditor of the commission has a different method of bookkeeping in this particular, and if it is better than the one insisted upon by Haskins & Sells, all that the commission has been able to say regarding it is that the reserve for the sinking fund 'may have been used for purposes foreign to the sinking fund.' They have not stated that this reserve was so used, and they could not correctly so state, because it has not been. These sinking fund securities were lying in the safe deposit vaults and the commission was requested to look and see.

"The property went through the depletion due to earthquake, fire and strikes. This was followed by a panic throughout the country. In spite of the heavy losses suffered by the company to its tracks and property and to the city generally, which was reflected in the business of the company, it got back in 1911 to an earning basis as of 1906, and in 1912 made an increase in earnings of about 7 per cent over 1906. The earnings of the property reached in October, 1912, the highest point ever reached in its history. The physical condition of the property is better than it has ever been before.

"If, as stated, this company has made additions, betterments and improvements since 1902 amounting to about \$11,000,000, rehabilitated itself and reconstructed a large portion of its roads, shops, buildings, machinery, etc.; if it has met its notes continuously for ten years; if it has paid during that time all its obligations; if it has complied with the terms and provisions of the sinking funds; if since 1902 it has issued and sold to the public only \$6,760,000 of bonds; if it has retired \$3,055,000 of bonds—then, with the prosperous future which seems before it and the city in which it operates, there can be no doubt of the ability of this company to meet its obligations as they mature."

Alexandria (La.) Electric Railways.—The Southern Traction & Power Company has taken over the property of the Alexandria Electric Railways.

American Cities Company, New York, N. Y.—At the annual meeting of the stockholders of the American Cities Company W. H. Freeman, Hugh McCloskey, James Michell and R. L. Montgomery were elected directors, to succeed

Lynn H. Dinkins, G. L. Edwards, William von Phul and Fernand Lapeyre.

Bowling Green (Ky.) Railway.—A petition has been filed in the Warren County Court at Bowling Green asking for a receiver for the Bowling Green Railway.

California Railway & Power Company, San Francisco, Cal.—An initial dividend of 1¼ per cent has been declared on the \$3,000,000 of prior preference stock of the California Railway & Power Company, payable on April 1, 1913, to holders of record of March 22, 1913.

Cities Service Company, New York, N. Y.—The boards of directors of the Cities Service Company, the Consolidated Cities Light, Power & Traction Company and the Utilities Improvement Company have approved a plan for the acquisition of additional properties and exchange of the securities of the underlying companies. Henry L. Doherty & Company, organizers and managers of the three corporations, state that under the rearrangement of properties and by the taking over of the new properties the net earnings of the Cities Service Company will be increased from \$1,113,732 for the year ended Dec. 31, 1912, to a basis of \$1,757,798 for the year ended on that date, and the amount earned on the common stock increased from slightly over 9 per cent to over 12 per cent even on the larger capitalization under the new plan. The net earnings of the Consolidated Cities Light, Power & Traction Company, which were \$308,238 for the year ended May 31, 1912, will be increased to a basis of \$715,232, with an earning power for the stock outstanding of 5.61 per cent as compared with a little more than 2.16 per cent. Net earnings of the Utilities Improvement Company, which were \$1,083,000 for the year ended Dec. 31, 1912, are increased to a basis of \$1,720,400, which will give 5.18 per cent on the outstanding common stock. The rate of earnings on the common stock of the Cities Service Company is thus increased 33 per cent; earnings for stock of the Consolidated Cities Light, Power & Traction Company are increased 160 per cent, and earnings for the common stock of the Utilities Improvement Company are increased 7.2 per cent.

Columbus, Delaware & Marion Railway, Marion, Ohio.—Dr. W. H. Netherland, of the Bank of South Louisville, Louisville, Ky., has submitted to the protective committee of stockholders in the Columbus, Delaware & Marion Railway a plan looking toward reorganization of the company. The members of the committee considering Dr. Netherland's plan are Judge Robert Worth Bingham, Louisville; Samuel Castleman, Louisville, and A. E. McBee, New York City.

Columbus, Marion & Bucyrus Railway, Bucyrus, Ohio.—Judge Babst at Marion, in the foreclosure suit brought by the Troy Trust Company, Troy, N. Y., as successor trustee, has ordered the sale of the property of the company by William Maloney as special master.

Columbus Railway & Light Company, Columbus, Ohio.—A hearing was held on Feb. 28, 1912, before the Public Service Commission of Ohio on the application of the Columbus Railway & Light Company for permission to consolidate the railway and lighting interests at Columbus as the Columbus Railway, Light & Power Company. S. G. McMeen, president of the company, explained that the consolidation is desired in order that the railway and lighting service may be continued at existing rates and that such extensions and improvements may be made as are needed. The railway and lighting plants operating separately cannot give the most economical service. This was realized some years ago, but the only means available then for operating these plants as a unit was the leasing plan. This had proved costly. At present it was necessary to keep nine complete sets of accounts and the system was too cumbersome. With the plants consolidated much of the clerical work could be eliminated. Attorney W. A. Henry, representing the stockholders of the Columbus Light, Heat & Power Company, said that the holders of the preferred stock of that company should receive Series A 6 per cent preferred stock of the Columbus Railway, Light & Power Company in exchange for their present preferred stock holdings, the same as is proposed for the holders of the preferred stock of the Columbus Edison Company, instead of 80 per cent of Series A preferred and 20 per cent of Series B 5 per cent preferred.

Gardner, Westminster & Fitchburg Street Railway, Gardner, Mass.—The Railroad Commission of Massachusetts has approved the consolidation of the Athol & Orange Street Railway and the Gardner, Westminster & Fitchburg Street Railway. The commissioners also approved an issue of 1850 shares of capital stock of a par value of \$100 by the Athol & Orange Street Railway, to be exchanged share for share for the capital stock of the Gardner, Westminster & Fitchburg Street Railway.

International Traction Company, Buffalo, N. Y.—Notice has been issued to holders of the 6 per cent collateral debentures of the Buffalo Railway that on April 1, 1913, the International Railway, formed by consolidation of the Buffalo Railway and other companies, will redeem all of the debentures issued under the trust agreement with the Metropolitan Trust Company, New York, under date of April 1, 1897.

Kankakee & Urbana Traction Company, Urbana, Ill.—A meeting of the stockholders of the Kankakee & Urbana Traction Company will be held to vote to increase the capital stock of the company from \$200,000 to \$500,000.

Massachusetts Electric Companies, Boston, Mass.—At a special meeting of the stockholders of the Massachusetts Electric Companies, held on March 4, 1913, it was voted to authorize the trustees to sell and dispose of all the preferred shares of the Bay State Street Railway which they may acquire during the current year, upon such terms and for such purposes as they may deem expedient. The stockholders further authorized the trustees to issue gold coupon notes of the Massachusetts Electric Companies to an aggregate amount not exceeding at the par value \$3,500,000, payable at such time or times and bearing such rate of interest as they may decide.

Mexico, Santa Fé and Perry Traction Company, Mexico, Mo.—Judge Barnett at Montgomery City, Mo., has postponed the hearing on the motion for the appointment of a receiver for the Mexico, Santa Fé & Perry Traction Company until the regular term of the Audrain County Court in March.

Ogden (Utah) Rapid Transit Company.—Royal Eccles has been elected a director of the Ogden Rapid Transit Company to succeed the late David Eccles, his father, who was president and a director of the company.

Omaha, Lincoln & Beatrice Railway, Omaha, Neb.—The Nebraska State Railway Commission has approved the application of the Omaha, Lincoln & Beatrice Railway for permission to issue \$2,250,000 of bonds and \$850,000 of stock. Accompanying the petition by the company to the commission there was a copy of a proposal from the Northern Construction Company, Detroit, Mich., to complete the railway through from Omaha to Lincoln. The Lincoln terminals of the Omaha, Lincoln & Beatrice Railway and the line eastward into Bethany Heights, a suburb, have been in operation for some time.

Peoria (Ill.) Railway Terminal Company.—The property of the Peoria Railway Terminal Company has been taken over by the two proprietary companies, the Chicago & Alton Railroad and the Chicago, Rock Island & Pacific Railroad. B. A. Worthington, president of the Chicago & Alton Railroad, has succeeded W. T. Irwin as president of the Peoria Railway Terminal Company, and A. C. Ridgeway, vice-president of the Chicago, Rock Island & Pacific Railroad, has been elected vice-president of the Peoria Railway Terminal Company in charge of operation. Officials of the two proprietary companies will become officers of the Peoria Railway Terminal Company in alternate years.

Plymouth & Sandwich Street Railway, Plymouth, Mass.—The Plymouth & Sandwich Street Railway has petitioned the Railroad Commission for authority to issue 3400 shares of additional capital stock, consisting of 2000 shares of 6 per cent cumulative preferred and 1000 shares of common, of a par value of \$100. The proceeds are to be used to pay floating indebtedness.

St. John (N. B.) Railway.—John R. Graham, president of the Bangor Railway & Electric Company, Bangor, Maine, and Henry W. Cushman, president of the Merrill Trust Company, Bangor, are said to have offered to purchase the stock of the St. John Railway at \$150 a share. The company has outstanding \$800,000 of stock.

Tampa (Fla.) Electric Company.—The Tampa Electric Company has increased its capital stock from \$1,870,000 to \$2,244,000.

Toledo & Chicago Interurban Railway, Kendallville, Ind.—The Supreme Court has authorized the sale of the Toledo & Chicago Interurban Railway under a petition submitted by James D. Mortimer, receiver. The upset selling price has been fixed at \$550,000. The date for the sale has not been determined. The property of the Toledo & Chicago Interurban Railway has been in the hands of a receiver since February, 1908.

Trenton, Philadelphia & Bristol Street Railway, Philadelphia, Pa.—The Trenton, Philadelphia & Bristol Street Railway has filed a certificate of increase in the capital stock of the company from \$358,000 to \$750,000.

Virginia Railway & Power Company, Richmond, Va.—A semi-annual dividend of 1½ per cent has been declared on the \$11,950,500 of common stock of the Virginia Railway & Power Company, payable on April 10, 1913, to holders of record of March 20, 1913. This payment compares with 1 per cent paid semi-annually from October, 1911, the date of the initial payment, to October, 1912, inclusive.

Washington (D. C.) Utilities Company.—It is reported that the Washington Utilities Company has arranged to take over the property of the Washington & Great Falls Railway, which is now under construction.

Dividends Declared

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1¼ per cent.

California Railway & Power Company, San Francisco, Cal., 1¾ per cent, prior preferred.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

Connecticut Valley Street Railway, Greenfield, Mass., 3 per cent, preferred.

Houghton County Traction Company, Houghton, Mich., 3 per cent, preferred; 2½ per cent, common.

Second & Third Streets Passenger Railway, Philadelphia, Pa., quarterly, \$3.

Terre Haute Traction & Light Company, Terre Haute, Ind., 3 per cent, preferred.

Virginia Railway & Power Company, Richmond, Va., 1½ per cent, common.

Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, CHICAGO, ILL.

Period.	Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.
1m., Jan., '13	\$140,578	*\$90,967	\$49,611	\$32,065	\$17,547
1 " " '12	125,717	*85,446	40,270	31,970	8,300
7 " " '13	1,191,064	*685,613	505,451	224,531	280,920
7 " " '12	1,108,662	*637,378	471,284	221,126	250,158

KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.

1m., Dec., '12	\$61,540	\$31,275	\$30,164	\$19,388	\$10,776
1 " " '11	56,627	32,927	23,699	17,176	6,523
6 " " '12	392,635	215,799	176,836	109,884	66,952
6 " " '11	369,782	211,365	158,417	105,024	53,393

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1m., Jan., '13	\$125,887	\$61,549	\$64,318	\$45,217	\$19,401
1 " " '12	102,522	54,019	48,504	39,486	9,018
12 " " '13	1,564,855	663,427	901,429	510,916	390,513
12 " " '12	1,372,497	602,655	769,842	463,231	206,611

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m., Jan., '13	\$209,389	\$122,535	\$86,853	\$43,825	\$43,029
1 " " '12	237,466	142,250	95,215	55,021	40,195

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Jan., '13	\$690,510	\$375,757	\$314,753	\$148,575	\$166,178
1 " " '12	635,509	364,934	270,574	140,079	130,495

VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.

1m., Dec., '12	\$424,422	\$196,223	\$228,099	\$123,166	\$104,933
1 " " '11	406,995	207,548	199,446	116,106	83,340
6 " " '12	2,488,442	1,207,977	1,280,464	741,792	538,672
6 " " '11	2,316,939	1,230,130	1,138,789	707,986	430,603

*Includes taxes.

Traffic and Transportation

Plan for Public Service Corporation Employees to Become Stockholders

The Public Service Corporation of New Jersey, Newark, N. J., has devised a plan in conjunction with the Fidelity Trust Company, Newark, by which the employees of both companies may become stockholders of the former. The method that has been devised, which makes it possible for the employees to purchase stock on the easiest possible terms, is set forth in the following communication addressed by President Thomas McCarter to the officers and the employees of the Public Service Corporation and its subsidiary companies, including the Public Service Railway:

"The corporation, acting with the Fidelity Trust Company, has purchased 5300 shares of the capital stock of the corporation, a portion of which will be offered to employees of the Fidelity Trust Company and its allied banking institutions, and the balance the corporation now offers to its officers and employees and those of the corporations in which it is interested at \$115 per share, subject to the following conditions:

"First. All subscriptions shall be made upon the express condition that the decision of the welfare committee of the corporation shall, at all times, be final with respect to rights or interests of such officers and employees subscribing for said stock, or any question relating to the same.

"Second. All subscriptions shall be for not less than one nor more than 100 shares. Subscriptions will be accepted with the understanding that there may be allotted to the subscriber all or any part of his subscription, as the welfare committee may determine. Preference will be given to small subscriptions in making allotments.

"Third. Subscribers shall pay on or before April 1, 1913, \$5 for each share allotted. The corporation has arranged with the Fidelity Trust Company to loan to purchasers the balance of \$110 per share, on the purchaser's note, with interest at the rate of 5 per cent. A stock certificate will be issued to the purchaser on or about April 1 and deposited with the Fidelity Trust Company as collateral for such loan.

"Fourth. Purchasers shall pay the treasurer of the corporation, on or before the last day of each month, an amount equal to \$1.50 for each share purchased and shall authorize the treasurer to deduct same from his or her wages if not paid by such date. Said payment or deduction of \$1.50 per month shall be paid by said treasurer to the Fidelity Trust Company on account of principal and to pay monthly interest. On this basis the loan will be paid in full in eighty-seven and a fraction months and certificate returned to the purchaser. As each purchaser becomes at once a stockholder, dividends after April 1, 1913, will be paid to the purchaser, and at the present rate of 6 per cent the dividend will equal every third month the amount paid for that month.

"Fifth. As officers and employees are permitted to purchase stock on the above easy terms, and as the purpose of the corporation is to benefit only those directly interested in the upbuilding and prosperity of the corporation, purchasers will enter into an agreement authorizing the corporation, or its agent, in the event of the purchaser's failure to make payments for any one month, or of purchaser's death, resignation or discharge, to sell or repurchase stock so bought at the price of \$115 per share. In such case the corporation will pay the balance due on shareholder's loan and the surplus to the shareholder; or, if deceased, to shareholder's legal representatives. In the event of purchaser's death, however, the right to repurchase given the corporation shall not be exercised within the sixty days next ensuing during which period purchaser's legal representatives shall have the right to pay the balance due on the loan and take up the stock.

"This offer to officers and employees is made by the corporation in the belief that it will prove beneficial to its business to have such employees become shareholders, and that many will desire to avail themselves of an opportunity to become shareholders under conditions which are not financially burdensome. This offer seems to present a cer-

tain means of saving and an investment which it is believed will become more profitable, beneficial and gratifying as the years go by.

"Subscriptions will close on March 22, 1913, and allotments will be made immediately thereafter, allowing subscribers time to make initial payments and sign necessary papers before April 1."

Safety Campaign in Brooklyn

The Brooklyn (N. Y.) Rapid Transit Company has entered into an arrangement with the American Museum of Safety for a six months' campaign in the public schools of Brooklyn on the subject of safety in the streets of the borough, and on March 3, 1913, the first presentations of safety facts were made in two of the elementary schools. This instruction will be extended from school to school as rapidly as the time of the two lecturers who are employed will allow until the entire borough is covered. It is estimated that in the four months which remain before the closing of the schools for the summer vacation most of the territory can be gone over. It is planned to continue the work in the vacation schools during the summer.

The basis of the campaign is furnished by the daily talks to the school children. These are followed up by the distribution of pamphlets, which the children are encouraged to take home and discuss with their parents. The talks themselves are illustrated by models which enable the lecturers to point out in a graphic way the correct and incorrect methods of boarding and alighting from cars, and by other models on the basis of which practical instruction can be given as to the handling of live wires and similar dangerous objects which may, through accident, be encountered in the public streets.

In connection with the lectures and distribution of literature the Museum of Safety is distributing safety buttons to children, these buttons having an attractive design of a green railroad lantern on a red ground, and thus carrying out the color scheme of the safety movement—green for safety and red for danger. A detailed study of operating mishaps of all kinds for two years past which the Brooklyn Rapid Transit Company has been making shows that in only approximately 17 per cent of the total cases where any kind of an operating mishap has been reported has there been an element of responsibility chargeable to the company or its employees. Legal responsibility has been found to exist in even a smaller percentage of cases. A beginning toward greater safety is made with the work among school children. Extensions are planned in a number of other directions.

Decision in Favor of the Illinois Traction System

The Interstate Commerce Commission has decided in favor of the Illinois Traction System the case of the St. Louis, Springfield & Peoria Railroad and the Peoria, Bloomington & Champaign Traction Company against the Peoria & Pekin Union Railway. The St. Louis, Springfield & Peoria Railroad and the Peoria, Bloomington & Champaign Traction Company operate interurban electric railways working under a common management with other electric railways, all known as the Illinois Traction System. In their complaint they alleged in substance that they have terminal facilities in Peoria for handling passengers and freight transported in interstate commerce; that the defendant refused to enter into arrangements whereby there may be an exchange of freight traffic from one to the other moving to and from interstate points from and to Peoria; that the defendant interchanges traffic between its lines and all steam railroads which enter Peoria; that in East Peoria, a point across the Illinois River from Peoria, complainants have yards and team tracks and that the defendant refused to make a switch connection whereby interstate traffic could be exchanged. They asked an interchange of traffic with the Peoria & Pekin Union Railway by the establishment of through routes. The defendant, the Peoria & Pekin Union Railway, is essentially a terminal company and at Peoria furnishes all terminal facilities and services in connection therewith to nine steam railroads and partial facilities and services to the other two steam railroads which

reach the city. It asserted the right to refuse absolutely the use of its terminals and facilities to complainants under Section 3 of the act, but was willing to permit their use upon the same terms and conditions accepted by the lines which are without any terminals and facilities in Peoria. The commission concluded its opinion in part as follows:

"The commission finds that these terms are prohibitive for the services actually sought by complainants and that the defendant, in effect, endeavors to compel them to pay for services which they do not desire and of which they can make no use. If the defendant receives fair compensation for the service which the complainants desire it to perform, there can be no question of the confiscation of property, as alleged by defendant. The terminal properties of carriers, like all other parts of their property, are devoted to the public use and must be treated exactly as all other parts of the property of common carriers are treated in carrying out the spirit and letter of regulatory statutes. Defendant is not asked to 'give' the use of its terminal properties, or any part of them, to any other carrier. It is asked to perform a service upon reasonable and just terms. The performance of such a service is the very reason of its existence. If the contention of defendant to the effect that its terminal properties are absolutely subject to its determining will were to be upheld, every community in this country would to that extent be absolutely at the mercy of those who control the existing terminals. Terminal properties are devoted to the public use of the whole of the communities in which they have been created. They are not a pre-empted domain against which the public can assert no rights and upon which it may impose no duties. If such a doctrine were to be accepted, every growing community would find it impossible to accept and encourage the service of carriers still to be created at reasonably convenient points within their respective boundaries.

"The commission is of the opinion that it is the duty of the defendant to perform for the complainants those services which they desire it to perform and no others, and to be paid for such as it performs and for no others; and that the complainants are entitled to through routes on interstate traffic passing through Peoria to points on their lines, and from interstate points to industries on the lines of defendant in Peoria, and from such industries to interstate points reached by complainants."

New Transfer Proposed for Worcester.—The Worcester (Mass.) Consolidated Street Railway has under consideration the adoption of a new form of transfer for use on its lines in Worcester.

Vote on Franchise Extension in Shreveport.—The authorization of the extension of the franchise of the Shreveport (La.) Traction Company until Sept. 22, 1954, will be submitted to a vote of the people at an election to be held on April 1.

New Offices for Morris County Traction Company.—The Morris County Traction Company, Morristown, N. J., has announced that on April 1, 1913, it will remove its general offices from Park and Market Streets, Morristown, N. J., to the second floor of the Parker Building in Park Place, Morristown.

Multiple-Unit Train Operation on Detroit United Railway.—The Detroit (Mich.) United Railway will start multiple-unit train operation between Jackson, Mich., and Detroit in the near future. At present this line is served by single cars. Multiple-unit service was started some time ago on the line between Port Huron and Detroit.

Accident at Bridge Terminal in New York.—A number of persons were injured slightly on March 2, 1913, when a three-car train of the Broadway elevated line of the Brooklyn (N. Y.) Rapid Transit Company crashed into the bumper at the terminal of the Williamsburgh Bridge in Manhattan. The lights in the train were extinguished by the accident, a panic ensued among the passengers, and the police were called to restore order. The terminal is underground.

Fare Case in New Jersey.—A hearing was held before the Board of Public Utility Commissioners of New Jersey recently in Newark in the case of the city of Long Branch against the Monmouth County Electric Company, Red Bank, in regard to the fare over the company's line, which is oper-

ated between Rumson, Oceanic, Fair Haven, Red Bank, Eatontown, Shrewsbury, and Long Branch. A reduction in fare to 5 cents is desired between Long Branch and Eatontown. The commission has ordered each side to submit briefs.

Liberal Transfer Concession in New York.—Chairman McCall of the Public Service Commission of the First District of New York announced on March 3 that Theodore P. Shonts, president of the Interborough Rapid Transit Company and the New York Railways, has made an informal agreement whereby residents of Staten Island will be permitted to transfer to the surface lines and reach points uptown in Manhattan for 5 cents, the price now charged for the ferry trip. These transfers will be issued for use at the Battery in going to or coming from Staten Island. Of the 5-cent fare the city will get 2 cents and the company 3 cents. Under the proposed arrangements the city will be in effect reducing the fare to 2 cents. While the terms of the transfer agreement will not be included in the subway contracts, the plan is a concession to Richmond Borough by the Interborough Rapid Transit Company.

"Car Full" Signs Tried at Boston.—In order to investigate the possibilities of improving the distribution of passengers and of insuring a more regular movement of cars, the Boston (Mass.) Elevated Railway has equipped thirty-five cars operating inward from Clarendon Hills station, Somerville, to the Boston business district by the East Cambridge Viaduct with "car full" signs. The signs are carried on the cars on two hooks in the vestibule at the right of the motorman and are displayed upon order of traffic inspectors. Each carries the words "Car Full" in white letters on a black background about 18 in. long and 9 in. wide, the signs being of metal and distributed one per car. When not in use the blank side is turned outward. The signs are used, on an average, on six to eight trips in the morning rush hours only, the headway on the line being two minutes at this period of the day. With so short a headway if a car is delayed it tends to become more and more crowded, which results in bunching. When the "Car Full" sign is in use the car does not stop to receive passengers, but makes the usual stops to discharge its load.

Review by Courts of New York Commutation Case.—The following statement was made public by the New York Central & Hudson River Railroad on Feb. 27, 1913, following the securing of a writ of certiorari by it for a review by the court of the order of the Public Service Commission of the Second District of New York requiring the company to readjust its commutation fares out of New York as referred to in the *ELECTRIC RAILWAY JOURNAL* of Feb. 15, 1913, page 399: "We do not intend to discontinue the sale of commutation tickets. The Public Service Commission, Second District, recently issued an order directing that certain of our commutation fares in our New York suburban territory be reduced to the fares which were in effect prior to July 1, 1910. Pending a decision as to the basis of the fares that should apply, we found it necessary to hold off the sale of commutation tickets for the month of March, until a writ of certiorari could be obtained from the court. The commutation tickets in our suburban zone for March will go on sale on Feb. 28. The tickets will be sold at the fares at present in effect, and pending the final disposal of the courts all passengers purchasing these tickets within the territory affected will receive a card, which, if the court of last resort shall decide the proceedings against this company, will have a redemption value of the difference between the price paid for the ticket and the price at which it was ordered to be sold by the Public Service Commission." An order has also been signed by Supreme Court Justice Alden Chester in Albany granting to the New York, New Haven & Hartford Railroad a writ of certiorari to review in the Appellate Division at Albany the determination of the Public Service Commission of the Second District in the commutation rate cases, and staying the commission from any proceeding to enforce its orders. The order provides that the railroad shall issue rebate slips so that in the event of a final determination against it the slips shall be redeemable for the amount of excess fare charged by the company on and after March 1, 1913.

Personal Mention

Mr. J. E. Gardner has been appointed electrical engineer of the Chicago, Burlington & Quincy Railroad, with headquarters at Chicago, Ill., vice Mr. H. A. Gardiner, resigned.

Mr. H. B. Sawyer, treasurer of the Stone & Webster Management Association, Boston, Mass., has been elected director of the Commonwealth Trust Company, Boston, Mass.

Mr. M. S. Browning has been elected president of the Ogden (Utah) Rapid Transit Company, to succeed the late David Eccles. Mr. Browning was formerly vice-president of the company.

Mr. R. N. Hamlin, who has been chief train dispatcher for the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, for some time, will become general superintendent of the company.

Mr. R. Morrison, Jr., for several years secretary and treasurer of the Michigan United Railway, Lansing, Mich., has been elected vice-president and secretary of the Lincoln (Neb.) Traction Company.

Mr. Joseph M. Burns has been appointed electrical engineer of the Morris County Traction Company, Morristown, N. J., in charge of power plants, transmission lines and overhead construction generally.

Mr. Martin J. Bogardus, formerly with the Otsego & Herkimer Railroad, Hartwick, N. Y., has been appointed master mechanic of the Morris County Traction Company, Morristown, N. J., in charge of all cars and equipment.

Mr. Daniel Riddle, Cincinnati, has been appointed superintendent of motive power of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, to succeed Mr. Charles Kilgour, whose resignation was recently announced.

Mr. Wilbur C. Fisk, who has been vice-president and general manager of the Hudson & Manhattan Railroad, New York, N. Y., was elected president of the company on March 6, 1913, to succeed Mr. William G. McAdoo, who has become Secretary of the Treasury under President Wilson.

Mr. John H. Marble, of California, has been nominated by President Wilson for appointment to the Interstate Commerce Commission to succeed Mr. Franklin K. Lane, who has been appointed Secretary of the Interior. Mr. Marble has for some time been secretary of the Interstate Commerce Commission.

Mr. J. M. Bramlette has been appointed general manager of the Lincoln (Neb.) Traction Company. Mr. Bramlette is well known in the electric railway field, having served as general manager of the Michigan United Railway, the East St. Louis & Suburban Railway and other important properties in the Middle West.

Mr. Edward Hamprecht, who has been chief clerk in the office of Mr. Charles J. Laney, traffic manager of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, has been appointed general freight and passenger agent of the company, following the resignation of Mr. Laney, who, as previously noted in the *ELECTRIC RAILWAY JOURNAL*, has become connected with the Cleveland, Southwestern & Columbus Railway.

Mr. Edgar E. Clark, of Iowa, has been nominated by President Wilson for appointment to the Interstate Commerce Commission. This is a reappointment for Mr. Clark. He was named by ex-President Taft to succeed himself on the commission, but the Democratic Senate held up the nomination. The Senate has now confirmed the nomination of Mr. Clark and he has been made chairman of the commission to succeed Mr. Lane.

Mr. James D. Fraser, secretary-treasurer of the Ottawa (Ont.) Electric Railway, has been elected a director of the company to succeed Senator Cox, resigned. Mr. Fraser has been connected with street railway work in Ottawa for the last thirty years. He was general manager of the Ottawa City Passenger Railway, and when the Ottawa Electric Railway took over that company in 1891 he was elected secretary-treasurer, in which capacity he has since served continuously.

Mr. Franklin Knight Lane, who has been appointed Secretary of the Interior by President Wilson, was chairman of the Interstate Commerce Commission. He is a lawyer and was born in Prince Edward Island July 15, 1864. He was graduated from the University of California in 1886. He began the practice of law at San Francisco in 1889 and was corporation counsel of San Francisco from 1897 to 1902. He was candidate for Governor of California in 1902 and got the party vote of the Legislature of California for United States Senator in 1903.

Mr. Clarence P. King, president of the Washington Railway & Electric Company, Washington, D. C., was presented recently with a bound volume containing an engrossed set of resolutions thanking him for the benefits that have accrued to the employees of the transportation department of the company since his connection with it. The presentation was made by Mr. W. F. Dement, assistant superintendent of transportation of the company, at a "get-together" meeting of the employees in the club rooms of the employees' relief association. Mr. J. T. Moffet, superintendent of transportation, addressed the men who were present at the meeting on the subject of handling crowds, having particular reference to the inauguration. Mr. F. J. Whitehead, manager of the claim department, spoke about the duties of trainmen before and after an accident.

Mr. Clinton L. Bardo, assistant to the general manager of the Lehigh Valley Railroad at South Bethlehem, Pa., and formerly superintendent of the electric division of the New York Central & Hudson River Railroad at New York, has been appointed general manager of the New York, New Haven & Hartford Railroad, with headquarters at New Haven, Conn., to succeed Mr. B. R. Pollock, resigned. Mr. Bardo was born at Montgomery, Pa., on Oct. 24, 1867, and began his railway career as an extra operator with the Pennsylvania Railroad. In November, 1904, he became freight trainmaster of the New York division of the New York, New Haven & Hartford Railroad, and from December, 1905, to June, 1907, he was assistant superintendent of the same division. From June, 1907, until April, 1911, he was superintendent of the Grand Central Station and the electric division of the New York Central & Hudson River Railroad.

Mr. William G. McAdoo, president of the Hudson & Manhattan Railroad, operating between New York and New Jersey under the Hudson River, has been named by President Wilson as Secretary of the Treasury. Mr. McAdoo was born near Marietta, Ga., on Oct. 31, 1863. He left the university at which he was studying at the end of his junior year. He took a place as clerk in the United States Circuit Court, studying law in his spare hours. He was admitted to the bar at Chattanooga, Tenn., when he was twenty-one. In 1892, when he was twenty-nine years old, he began the practice of law in New York, and four years later he formed a partnership with Mr. William McAdoo, former Police Commissioner of New York. Ten years after coming to New York Mr. McAdoo launched the enterprise of burrowing under the Hudson River to link the cities of the Jersey shore to the shopping districts of Manhattan. Mr. McAdoo's rule of business has always been "The public be pleased."

Mr. Frank H. Brown, superintendent of the Pawtucket and Woonsocket lines of the Rhode Island Company, Providence, R. I., has been placed in entire charge of the northern division of the Rhode Island Company, which includes the Pawtucket and Woonsocket lines and the North Main Street carhouse in Providence. He will be in full charge north of Providence. Mr. Brown is to have control of hiring motor-men, conductors, starters, etc. He was appointed superintendent of the Pawtucket lines on Oct. 1, 1906, and was made superintendent of the Woonsocket Street Railway on Feb. 1, 1908. The new order virtually means a division of the operating systems of the company into two sections, northern and southern. Mr. Brown is to have charge of the northern section and Mr. R. R. Anderson, superintendent of transportation, is to have charge of the southern section. Heretofore this work has been under the jurisdiction of Mr. Anderson, and the change has been made in order to relieve Mr. Anderson of a portion of his work and responsibilities.

Construction News

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

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

RECENT INCORPORATIONS.

Mobile & Baldwin County Railroad, Mobile, Ala.—Chartered in Alabama to build an interurban railway between Mobile and Pensacola; also between Mobile and Bay Minette. Capital stock, \$50,000. Officers: W. B. Miller, Chicago, president; M. H. Miller, Mobile, vice-president, and John P. Lowell, Mobile, secretary. [E. R. J., Jan. 25, '13.]

Jacksonville & St. Augustine Public Service Corporation, St. Augustine, Fla.—Chartered in Florida to build a 55-mile electric railway between Jacksonville and St. Augustine and a 16-mile branch from Jacksonville to Diego and Pablo Beach. Capital stock, \$2,000,000. A. W. Corbett, president, and Thomas R. Osmond, general manager. [E. R. J., Feb. 15, '13.]

***Livermore & Augusta Street Railway, Augusta, Maine.**—Application for a charter has been made by this company in Maine to build an electric railway to connect East Livermore, Fayette, Mount Vernon, Readfield, Winthrop, Manchester and Augusta. Capital stock, \$250,000. Incorporators: Charles P. Hatch, Portland; Reuel J. Noyes, Elmer E. Newbert and Leon O. Tebbetts, Augusta; E. E. Peacock, Nelson T. Gordon and B. E. Leighton, Readfield; William G. Hunton, Cherryfield.

***St. Louis, Afton & Sunset Railway, Afton, Mo.**—Application for a charter has been made by this company in Missouri to build a 10-mile railway from Afton to Sunset Inn and Fenton, via Sappington. The line will parallel the Gravois Road. This project is said to be a continuation of the line of the St. Louis, Grant Park & Lakewood Electric Railroad. Capital stock, \$300,000. Incorporators: Victor J. Miller, John M. Storm, J. L. Boehl, James Arbuckle and C. A. Bodwell.

Peninsula Railway, Wilmington, N. C.—Application for a charter has been made by this company in North Carolina to build a line from Wilmington to Ocean Beach and the mouth of Cape Fear River. Capital stock, \$100,000. Incorporators: Iredell Meares, George F. Meares, William A. Williams and William H. Green.

***Oklahoma Northern Railroad, Vinita, Okla.**—Chartered in Oklahoma to build an electric or steam railway from Vinita to Nowata, Okla., and Coffeyville, Kan. Capital stock, authorized, \$50,000. Incorporators: A. King, H. L. Steen and G. D. Meiklejohn, Omaha, Neb.; W. F. Snodgrass and J. W. Tolliver, Centralia, Okla.

FRANCHISES

Birmingham, Ala.—The Birmingham Railway, Light & Power Company will be granted the Twenty-first Street franchise if that company is willing to let the Kelly company or any other company which might later operate cars here use the track that is already down and the track that is to be laid. The company has asked the Council for a franchise to build a line to Lewisburg.

Bay City, Cal.—The Pacific Electric Railway has asked the Supervisors of Orange County for an extension of its Alamitos-Long Beach line to and through Bay City. This will give a direct line to Long Beach along the coast.

Richmond, Cal.—The San Francisco-Oakland Terminal Railways has received a certificate of public convenience and necessity to exercise franchise rights to operate an electric railroad along Standard Avenue and on a private right-of-way in Richmond.

South San Francisco, Cal.—The South San Francisco Railroad & Power Company has asked the Board of Trustees for a franchise in South San Francisco.

***St. Petersburg, Fla.**—Noel A. Mitchell, St. Petersburg, has received a franchise for a gasoline railway on the island of Passagrille.

Evanston, Ill.—The County Traction Company, Chicago, has received a ninety-day franchise from the Council in Evanston.

Terre Haute, Ind.—The Springfield & Central Illinois Traction Company has asked the Board of Public Works for a franchise to build an interurban line on Walnut Street. The company proposes to build a bridge across the Wabash River at Walnut Street and to build a station at Ninth and Walnut Streets in Terre Haute.

Vincennes, Ind.—The Vincennes North & South Traction Company has asked the Council for a franchise in Vincennes. This company plans to build a line to connect Vincennes and Indianapolis via Bicknell, Sullivan, Clay City, Linton, Cataract, Eminence and Mooresville. B. M. Willoughby, Vincennes, president. [E. R. J., May 11, '12.]

Wichita, Kan.—The Arkansas Valley Interurban Railway has asked the county commissioners of Harvey County for an extension in that county from the Newton terminus to Bethel College. Franchises secured from Newton and the county give the company a right-of-way in Main Street.

Rome, N. Y.—The New York State Railways has asked the Common Council for a franchise in East Dominick Street and West Dominick Street in Rome.

Cleveland, Ohio.—The Cleveland Railway has asked the approval of the City Council for the construction of a cross-town line on East Seventy-ninth Street.

Columbus, Ohio.—The Fifth Avenue Railway & Light Company has asked the Council for a franchise to build a crosstown line from Arlington east on Fifth Avenue to East Columbus.

Henryetta, Okla.—C. H. Kellogg has asked the Council for a franchise in Henryetta.

Ashland, Ore.—The E. P. Minney Company, Oakland, has received a franchise from the Council in Ashland. [E. R. J., March 1, '13.]

Portland, Ore.—The Portland Railway, Light & Power Company has received a franchise from the Council over approximately 18 miles of streets in Portland.

Koppel, Pa.—The Pittsburgh, Harmony, Butler & New Castle Railway has asked the Council for a franchise for a right-of-way through Koppel.

Shippensburg, Pa.—The Chambersburg & Shippensburg Railway has received a franchise from the Council in Shippensburg. This line will connect Chambersburg, Erd Bridge Park and Shippensburg. T. M. Mahon, president. [E. R. J., Feb. 8, '13.]

Cranston, R. I.—The Rhode Island Company will ask the Council for a new franchise in Cranston.

Dallas, Tex.—E. P. Turner and associates have received a franchise from the Council in Dallas. This is part of a plan to build an electric railway between Denton and Gainesville.

TRACK AND ROADWAY.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—Work will soon be begun by this company on an extension from the end of the North Birmingham line to Lewisburg.

Montgomery Light & Traction Company, Montgomery, Ala.—This company announces that it will extend its line into Wetumpka if a bridge is built across the Tallapoosa River and the right-of-way given to cross it.

Pacific Electric Railway, Los Angeles, Cal.—This company has been asked to consider plans to double-track its line between Huntington Beach and Balboa.

Modesto & Empire Traction Company, Modesto, Cal.—A 20-mile line between Modesto and Newman will be built by this company during the year.

St. John's Electric Company, St. Augustine, Fla.—Work has been begun by this company on the extension from South Beach south about 1 mile.

Tampa (Fla.) Electric Company.—About 3 miles of city track will be built in Tampa by this company during the year.

Aurora, Elgin & Chicago Railroad, Wheaton, Ill.—This company announces that a project to extend its Carpentersville line to Crystal Lake, and eventually to Woodstock, is being considered.

***Jacksonville, Ill.**—Fred Amrhein, New Berlin; A. P. Gunnett, Gardner, and John W. Boston, Jacksonville, have

been appointed a committee to investigate the feasibility of forming a new corporation to take over the properties of the Springfield & Jacksonville Electric Railway, for which grading has been done.

Chicago & Joliet Electric Railway, Joliet, Ill.—Plans are being made by this company to double-track its line on Jefferson, Chicago and South Chicago Streets and Eastern Avenue, to rebuild track on Center, Collins and West Park Streets and build new track on Washington Street in Joliet.

***French Lick Springs, Ind.**—McPherson Sheppard, Boston, Mass., representing capitalists of Pittsburgh, Pa., recently made a thorough inspection of the country between New Albany, Paoli and French Lick Springs, Ind., covering a considerable distance, and it is understood that a survey for an electric railway line from New Albany to French Lick will be made shortly.

Laporte, Logansport & Southern Railroad, Laporte, Ind.—This company will soon ask for bids for the construction and equipment of an electric railway from Laporte to Logansport. Warren W. Travis, vice-president. [E. R. J., March 1, '13.]

Louisville & Northern Railway & Lighting Company, New Albany, Ind.—The New Albany Board of Public Works, New Albany, is considering a proposition whereby this company is to lay T-rails instead of girder rails in the reconstruction of its line on Market Street between Thirteenth Street and Vincennes Street in New Albany.

Union Traction Company of Indiana, New Castle, Ind.—The contractors working on the extension between New Castle and Muncie announce that the new branch will be in operation by July 1.

***Rochester, Ind.**—Steps have been taken to build an electric line from Rochester to Akron, a distance of 10 miles. A subsidy will be asked from Henry township to pay for the right-of-way and an additional subsidy will be asked from Rochester to pay for the rails. Douglas Head & Company are the contractors for the work on the Rochester-Akron line.

Iowa City (Ia.) Electric Railway.—About 5 miles of new track will be built by this company during 1913. J. O. Schulze, president.

Kentucky Utilities Company, Lexington, Ky.—This company is planning to construct an extensive interurban railway system operated out of Winchester, Ky., and connecting with Richmond, Mount Sterling and a number of other cities.

Paducah (Ky.) Traction Company.—Plans are being made by this company to relay some of its lines in Paducah with new and heavier rails.

New Orleans Railway & Light Company, New Orleans, La.—Plans are being made by this company to make extensive improvements to its Villere lines between Canal Avenue and St. James Avenue in New Orleans.

North Louisiana Electric Railway, Shreveport, La.—Preliminary surveys are being made by this company on its line from Shreveport to Monroe, via Minden, Ruston and Homer. A. B. Blevins, Jefferson, president. [E. R. J., March 1, '13.]

Towson & Cockeysville Electric Railway, Towson, Md.—About 4 miles of new track will be built by this company during the year.

Ironwood & Bessemer Railway, Ironwood, Mich.—This company will build 3 miles of new track during the year.

Kansas City, Lawrence & Topeka Electric Railroad, Kansas City, Mo.—During 1913 this company plans to build 25 miles of new track between Zarah, De Soto, Endora and Lawrence.

Jersey Central Traction Company, Keyport, N. J.—During the year this company plans to build 8 miles of new track from Long Branch to Red Bank.

Geneva & Auburn Railway, Seneca Falls, N. Y.—During 1913 this company plans to build 12 miles of new track between Seneca Falls, Cayuga and Auburn.

Durham (N. C.) Traction Company.—Plans are being considered by this company for a 12-mile line from Durham to Chapel Hill, N. C.

Cleveland (Ohio) Railway.—During 1913 this company plans to build 7 miles of new track.

Columbus, Urbana & Western Electric Railway, Columbus, Ohio.—Bids will be asked by this company to build a line from Fishinger's Bridge, near the Scioto River storage dam, to the Girls' Industrial School near Delaware, Ohio.

Toledo & Indiana Railway, Toledo, Ohio.—Plans are being made to extend this railway from Bryan to Montpelier, a distance of 10 miles, where it will connect with the St. Joseph Valley Traction Company's line now practically completed to the state line between Ohio and Indiana. This would make a complete through route between Toledo and Chicago.

Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio.—Surveys are being made by this company for an extension from its present terminal, 7 miles south of Monroe, through to Detroit.

Toledo & Western Railroad, Toledo, Ohio.—Plans are being considered by this company to build a line from Pioneer to meet the line of the St. Joseph Valley Traction Company at Angola.

Youngstown & Southern Railway, Youngstown, Ohio.—This company announces that it will make extensive improvements between Youngstown and Southern Park.

Oklahoma, Kansas & Missouri Interurban Railway, Miami, Okla.—This company plans to build 2 miles of new track from North Miami to Blue Mound during 1913.

Cushing & Oil Field Electric Railway, Perry, Okla.—This company has been organized to build an electric railway in Perry. The company has asked the City Council of Perry for a franchise. Among those interested are John B. Queen, Perry; Charles Reed, Coyle, and J. R. Hadley, Cushing.

Medford, Ore.—Work has been begun on the line between Medford and Ashland by the F. P. Minney Company, Oakland. [E. R. J., March 1, '13.]

Oregon Electric Railway, Portland, Ore.—During 1913 this company plans to build a 30-mile extension between Tualitin and McMinnville, Ore., and a 6-mile freight cut-off between Orengo and Helvetia, Ore.

Imperial Traction Company, Ottawa, Ont.—This company has asked the House of Commons for permission to build an extension from Smithville to Bridgeburg and from Hamilton to Toronto.

Humber Valley Railway, Toronto, Ont.—This company has received the approval of the Ontario Railway Board to build a double-track railway through the Humber Valley from Lambton to the mouth of the Humber River and along the shore to Sunnyside.

Westside Electric Street Railway, Charleroi, Pa.—This company will build 9 miles of new track from Charleroi to Ellsworth during 1913.

Slate Belt Electric Street Railway, Pen Argyl, Pa.—This company will build 1 mile of new track from Wind Gap to Sayers Lake during the year.

Reading (Pa.) Transit Company.—Plans are being made by this company to lay new track on North Ninth and North Tenth Streets in Reading.

Sioux Falls & Southern Minnesota Traction Company, Sioux Falls, S. D.—Right-of-way has been secured and construction has been begun by this company on its line between Albert Lea and Sioux Falls. W. H. Knight is interested. [E. R. J., Nov. 30, '12.]

Nashville-Gallatin Railway, Nashville, Tenn.—Plans are being made for an extension of the new line of this railway into Kentucky, terminating at Glasgow for the present, and it is believed that Louisville, Ky., will be the ultimate terminus of the division. An extension out of Nashville into Gallatin is now in course of construction.

Bryan & College Interurban Railway, Bryan, Tex.—Arrangements are being made by this company to build an extension from Stone City to the Brazos River.

***St. John & Quebec Railway, Quebec, Que.**—Surveys have been begun by this company for an electric line from Washburn across northern Maine to the Canadian border.

Rhode Island Company, Providence, R. I.—Two acts have been introduced in the House authorizing the towns of Gloucester and Smithfield respectively to make contracts with this company guaranteeing certain payments for the construction and operation of an electric railway. Surveys have been made by this company for the construction of its proposed 12-mile extension from Centerdale to Chepachct.

Texas Traction Company, Dallas, Tex.—Plans are being considered by this company to build an extension to St. Vincent's Sanitarium.

San Antonio & Austin Interurban Railway, San Antonio, Tex.—This company has about 20 miles of the location work finished. Vories B. Brown, San Antonio, president. [E. R. J., Feb. 22, '13.]

San Antonio (Tex.) Traction Company.—This company plans to build 2 miles of new track during 1913.

Ogden (Utah) Rapid Transit Company.—This company plans to extend its line to Logan in the near future.

Walla Walla Valley Railway, Walla Walla, Wash.—During 1913 this company plans to build 5 miles of new track between State Line and Vincent, Ore.

Elkins (W. Va.) Electric Railway.—During the year this company plans to build about 7 miles of new track between Roaring Creek Junction and Belington, W. Va.

Monongahela Valley Traction Company, Fairmont, W. Va.—Plans are being made by this company to make an important change in the route of the Clarksburg and Weston line so as to have the Clarksburg terminal of the line at the interurban station.

***Beloit, Wis.**—It is reported that representatives of Indianapolis capitalists are considering the construction of an electric railway between Beloit and Delavan. No names are yet given.

SHOPS AND BUILDINGS

Edmonton (Alta.) Radial Railway.—During the next three months this company plans to build an addition to its north side carhouses and will build a new carhouse on the south side.

Georgia Railway & Electric Railway, Atlanta, Ga.—This company has purchased land in Atlanta on which it plans to build a new carhouse in the near future.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—Bids are being asked by this company to build a new freight depot in Logansport. The structure will be one-story, 30 ft. x 138 ft., and of brick construction.

Paducah (Ky.) Traction Company.—Plans are being made by this company to double the capacity of its present carhouse.

Detroit (Mich.) United Railway.—This company will remove the carhouse of the Pontiac division from Birmingham to Pontiac.

Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.—During the year this company plans to build a new freight house in Grand Rapids. The structure will be 40 ft. x 150 ft. The company will also build a new passenger and freight station at Spring Lake.

Minneapolis (Minn.) Street Railway.—Plans are being made by this company to purchase property on Twenty-fifth Avenue north between Washington Avenue and Second Street in Minneapolis on which to build a carhouse.

Twin City Rapid Transit Company, Minneapolis, Minn.—This company plans to build a new station in Minneapolis. It will be located on two square blocks between Twenty-fourth Avenue and Twenty-sixth Avenue and will accommodate 200 cars.

Piedmont Traction Company, Charlotte, N. C.—Plans are being made by this company to construct a modern four-story building on the corner of West First Street and South Church Street in Charlotte.

Scioto Valley Traction Company, Columbus, Ohio.—During the year this company expects to build a new passenger and freight terminal at Columbus.

Regina (Sask.) Municipal Railway.—During the next three months this company plans to build an extension to its carhouse. The addition will be 200 ft. x 80 ft.

Greenville, Spartanburg & Anderson Railroad, Greenville, S. C.—Plans are being made by this company to build new passenger station, freight terminal, etc., in Spartanburg.

Texas City (Tex.) Street Railway.—Material has been ordered by this company for its new carhouse. The structure will be 40 ft. x 90 ft. and of corrugated-iron construction.

Puget Sound Electric Railway, Tacoma, Wash.—This company plans to build a new waiting station at Stone Way and Weslake Avenue in Seattle.

Ohio Valley Electric Railway, Huntington, W. Va.—Contracts will soon be awarded by this company to build a terminal station in Huntington. The structure will be eight stories, of steel and reinforced concrete construction, "L" shape, 60 ft. x 160 ft. x 30 ft. It will contain general offices, waiting rooms, etc.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Victoria, B. C.—A new substation with a capacity of 2000 kw will soon be built by this company. It expects to purchase one motor-generator set and a transformer.

Alton, Granite & St. Louis Traction Company, Alton, Ill.—Plans are being made by this company to build a new power house in Alton.

Southern Illinois Railway & Power Company, Harrisburg, Ill.—This company will install two 1250-kva Curtis turbo-generator units with a 35-kw turbo-driven exciter and 50-kw motor-generator set, two 300-kw motor-generator sets, three 250-kw water-cooled transformers and switch-board apparatus for its power station and substation. This apparatus has been ordered from the General Electric Company.

United Water, Light & Traction Company, Somerset, Ky.—Plans are being made by this company to build a new power plant in Somerset. Frank Barker is in charge of the arrangements.

Manhattan Bridge Three-Cent Line, Brooklyn, N. Y.—This company will add to its substation equipment a 500-kw rotary converter, three 165-kva air-blast transformers, 6000 cu. ft. blower set and switchboard. The apparatus has been ordered from the General Electric Company.

Tidewater Power Company, Wilmington, N. C.—This company plans to build soon a new brick substation at Winter Park. The company expects to purchase a 500-kw rotary and transformer for its Wrightsville Beach substation.

Oregon Electric Railway, Portland, Ore.—This company has ordered from the General Electric Company a new 500-kw 33-cycle 1200-volt rotary-converter to be installed in one of its substations.

Portland Railway, Light & Power Company, Portland, Ore.—Work has been begun by this company for its new power station, office, waiting room and substation in Vancouver, Wash. The steam plant will have a battery of three boilers and will use either oil or sawdust for fuel. The office and waiting room will be two stories high, 50 ft. x 26 ft., and will be located at the corner of First Street and Washington Street.

Citizens' Traction Company, Oil City, Pa.—This company expects to remodel its power house, paint and carpenter shops in Oil City. It plans to install a 1500-kw turbine together with coal and ash-handling apparatus at its West End power house, Oil City, and a 300-kw rotary converter at the Franklin substation.

Southern Traction Company, Dallas, Tex.—Plans are being made by this company to build new substations at Waxahachie, Hillsboro, Corsicana, Ennis and Lisbon.

Texas Traction Company, Dallas, Tex.—This company has awarded a contract for one 425-hp B. & W. boiler to be installed at its power house at McKinney, together with a type L Green stoker for same. It expects to purchase coal and ash-handling machinery to take care of five such boilers.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—During the year this company plans to purchase two 1000-kw motor-generator sets for its power house.

Manufactures and Supplies

ROLLING STOCK

Public Service Railway, Newark, N. J., is building twenty cars in its own shops.

Ocean City (N. J.) Electric Railroad is reported to be in the market for six cars.

Union Electric Company, Dubuque, Ia., is figuring on six 40-ft. double-truck prepayment cars.

Durango Railway & Realty Company, Durango, Col., expects to purchase two double-truck open cars.

Norwich & Westerly Traction Company, Norwich, Conn., anticipates purchasing additional cars, trucks and motors.

Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., is reported to be in the market for one city and one inter-urban car.

Northern Illinois Electric Railway, Chicago, Ill., expects to purchase twelve box cars and possibly two double-truck interurban cars.

Atchison, Topeka & Santa Fé Railway, Chicago, Ill., has ordered two gas-electric motor cars from the General Electric Company.

Massachusetts Northern Railways, Greenfield, Mass., has ordered ten double-truck open cars from the Wason Manufacturing Company.

Manhattan City & Interurban Railway, Manhattan, Kan., will probably purchase two single-truck motor cars and ten light double-truck trailer or open cars.

United Railways, St. Louis, Mo., has been recommended by the Public Utilities Commission of St. Louis to purchase 165 motor cars and 165 trail cars at a cost of \$1,650,000.

Southwestern Traction & Power Company, New Iberia, La., has ordered from the American Car Company one 40-ft. 5-in. passenger and baggage car mounted on Brill 27 MCB trucks.

Virginia Railway & Power Company, Richmond, Va., noted in the *ELECTRIC RAILWAY JOURNAL* of March 1, 1913, as figuring on several new cars, is in the market for twenty cars for city operation. The plans and specifications for this equipment have not yet been completed.

Jacksonville (Fla.) Traction Company has specified the following details for the ten double-truck single-end closed prepayment cars which are being built by the St. Louis Car Company:

Seating capacity.....	40	Bumpers, 6 in. 8 lb. channel
Bolster centers, length,		Car trimmings.....bronze
	22 ft. 2 in.	Couplers.....Hovey
Length of body, 29 ft. 6½ in.		Curtain fixtures.....Cur. S. Co.
Length over buffer,		Curtain material.....Pantasote
	41 ft. 0 in.	Destination signs.....Hunter
Width over sheathing,		Gongs.....Wall
	8 ft. 4 in.	Hand brakes.....Peacock
Width over all.....	8 ft. 8 in.	Headlight.....Neal
Height, rail to sills.....	32¾ in.	Motors.....outside-hung
Sill to trolley base,		Sash fixtures.....Edwards
	8 ft. 6¾ in.	Seats.....H-W
Body.....	composite	Step treads.....Mason
Interior trim.....	mahogany	Trolley retrievers.....Knutson
Roof.....	plain arch	Ventilators,
Underframe.....	steel	S. & W. Vacuum

Dallas (Tex.) Consolidated Street Railway, reported in the *ELECTRIC RAILWAY JOURNAL* of Feb. 15, 1913, as having ordered ten closed prepayment cars from the St. Louis Car Company, has included the following details in the specifications for this equipment:

Seating capacity.....	38	Curtain material.....Cur. S. Co.
Bolster centers, length,		Destination signs.....Hunter
	19 ft. 2 in.	Gongs.....Wall
Length of body.....	26 ft. 6 in.	Hand brakes.....St. L.
Length over vestibule,		Heaters.....Consol.
	39 ft. 6 in.	Headlights.....C-H
Length over all.....	8 ft. 4 in.	Motors.....GE-203
Height, rails to sills.....	32¾ in.	Paint.....S-W
Sill to trolley base,		Registers.....Inter.
	8 ft. 6¾ in.	Sanders.....St. L.
Body.....	metal	Sash fixtures.....Edwards

Interior trim	mahogany	Seats	St. L.
Headlining	Agasote	Step treads	Mason
Roofarch	Trolley catchers ..	Keystone
Underframe	semi-steel	Trolley base	Wilson
Air brakes	West.	Varnish	Flood & Conklin
Car trimmings	St. L.	Ventilators	St. L.
Couplers	St. L.	Wheelguards	H-B
Curtain fixtures ..	Cur. S. Co.		

TRADE NOTES

Baldwin Locomotive Works, Philadelphia, Pa., have elected James W. Bayard a director to succeed E. C. Converse, who resigned recently.

B. J. Coghlin Company, Ltd., Montreal, Quebec, has moved its offices into the new buildings which it has erected next to its factory on Ontario Street, East Montreal.

Pittsburgh Roller Bearing Company, Pittsburgh, Pa., has been chartered in West Virginia with an authorized capital stock of \$3,500,000 to manufacture roller bearings and other machinery.

Woodmansee, Davidson & Sessions, Chicago, Ill., announce the retirement of E. O. Sessions on March 1 as a member of the firm. Mr. Sessions has not yet announced his plans for the future.

New Castle Steel & Iron Company, New Castle, Pa., has formally taken over the plant and the property of the New Castle Forge & Bolt Company and will remodel the property for the manufacture of steel cars and steel car specialties, mainly the latter.

Abrasive Material Company, Bridesburg, Pa., has opened its own branch store at 566 West Randolph Street, Chicago, Ill., under the management of C. W. Blakeslee. The company has just completed a plant at Bridesburg, where it has purchased a large tract of land.

International Register Company, Chicago, Ill., has completed and is now occupying its new factory building at 15 South Throop Street, Chicago. The company has three times its former floor space and has added a brass foundry so that its plant now includes all processes of manufacture.

New Haven Trolley Supply Company, New Haven, Conn., has been incorporated with a capital stock of \$10,000 to engage in the trolley supply business. The officers of the company are: Arthur C. Stowe, president; Howard C. Webb, vice-president; Samuel P. Huntington, secretary and treasurer.

Drake Railway Automotrice Company, Chicago, Ill., has acquired the going automotrice business of the Société Anonyme Westinghouse, Paris and Havre, the territory of which comprises Holland, Belgium, Luxemburg, France, Switzerland, Spain, Portugal, their colonies and protectorates. The negotiations were conducted by Francis E. Drake, president of the company, who is now in Paris.

Electric Railway Improvement Company, Philadelphia, Pa., has received orders for cars from the following companies since the first of the year: Jacksonville (Fla.) Traction Company, Metropolitan West Side Elevated Railway, Chicago, Ill.; Knoxville Railway & Light Company, Knoxville, Tenn.; Phoenix (Ariz.) Railway, Pacific Electric Railway, Los Angeles, Cal.; Omaha & Council Bluffs Street Railway, Omaha, Neb.

Railway Steel Spring Company, New York, N. Y., reports gross earnings for the year ended Dec. 31, 1912, as \$9,041,079, compared with \$6,160,496 for the previous year. The surplus for the year after deducting all charges, including dividends on the preferred stock, was \$778,978, compared with \$39,798. The company earned 5.77 per cent on its \$13,500,000 common stock, after charging off \$359,986 for depreciation as against 0.3 per cent earned on the same stock in the preceding year.

Transmission Engineering Company, Pittsburgh, Pa., has been organized to do special transmission line work. It is affiliated with the Railway & Industrial Engineering Company, manufacturer of the Burke horn-gap apparatus, and is making a specialty of outdoor steel substations and special work for terminal towers, station outlets, railroad crossings and similar requirements. The officers are H. L. Patterson, president; G. N. Lemmon, vice-president, and general man-

ager; B. W. Kerr, secretary and treasurer; A. W. Burke, consulting engineer.

General Electric Company, Schenectady, N. Y., has recently received the following orders for railway motors: Michigan United Traction Company, Jackson, Mich., ten GE-210 70-hp two-motor equipments; Oregon Electric Railway, Portland, Ore., six GE-222 100-hp, 600-1200-volt four-motor equipments and six trail car equipments; Southern Illinois Railway & Power Company, Harrisburg, Ill., four GE-205 100-hp four-motor equipments, an express car equipment and four extra air-brake equipments with CP-27 compressors; Detroit (Mich.) United Railway, 125 GE-203 50-hp two-motor equipments; Salt Lake & Ogden Railway, Salt Lake City, Utah, two GE-205 100-hp four-motor equipments and two extra GE-205 motors; Bay State Street Railway, Boston, Mass., three GE-205 50-hp four-motor equipments; Springfield (Mass.) Street Railway, four GE-80 40-hp four-motor equipments; Milwaukee Electric Railway Light Company, Milwaukee, Wis., two GE-205 75-hp motors with type M multiple-unit control; Galveston (Tex.) Electric Company, ten GE-200 38-hp two-motor equipments.

ADVERTISING LITERATURE

Busch-Sulzer Brothers-Diesel Engine Company, St. Louis, Mo., has issued an eight-page booklet, which contains the results of an exhaustive test of a 225-hp Diesel engine built by the company for the Hugo Ice & Light Company, Hugo, Okla.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued Bulletin No. 126, which is devoted to a description of compression riveters, and Bulletin No. 129, which describes and illustrates hose, hose couplings and hose clamp tools.

The J. G. Brill Company, Philadelphia, Pa., has issued *Brill Magazine* for February, 1913, which contains an illustrated biography of Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, New York, N. Y. Among the featured articles are the following: "More Semi-Convertible Cars for the Northern Ohio Traction & Light Company," "Passenger and Baggage Cars for Nashville-Gallatin Interurban Railway," "Additional 'Washington' Center-Entrance City & Interurban Cars," "Fifty 'California' Cars for Los Angeles," "New Cars for Laurel, Miss."

NEW PUBLICATIONS

Book of Standards. National Tube Company, Pittsburgh, Pa. Flexible leather, 1913 edition, 559 pages, 4 in. x 6½ in. Price, \$2.

This successor to the 1902 handbook of the National Tube Company is a splendid addition to engineering reference books both in contents and mechanical make-up. Its primary purpose is to present a remarkable array of information on tubular products as gathered by nearly four years of experiment and research, but it also includes many valuable tables covering the conversion of metric dimensions, etc., to English equivalents and vice versa, besides a conversion chart for length, weights and temperatures. A unique feature is a glossary of definitions and abbreviations used in the pipe and fitting trade. Not the least appreciated feature of this book will be the use of Canterbury Bible paper, which makes it a real pocket book, despite its 559 pages.

Essentials of Electricity. By W. H. Timbee. New York: John Wiley & Sons. 1913. 271 pages. Cloth. Price, \$1.25.

This work, as indicated by the title is especially suitable for students of electricity who wish to enter or advance themselves in one of the electrical trades. It explains the underlying facts and laws of good electrical practice which electrical workers must understand, but does not include extended descriptions of the mechanical processes of the electric trades. Only such material has been included as is absolutely essential to the object in view. The author is exceptionally concise and has introduced at the end of each chapter a summary of the material contained in it. A series of problems covering the work of each chapter is also included. These should prove of exceptional value to the home student if he is earnest enough to work them out conscientiously.