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JAMES H. MCGRAW, President.

HUGH M. WILSON, 1st Vice-President. A. E. CLIFFORD, 2d Vice-President.

CURTIS E. WHITTLESEY, Secretary and Treasurer.

TELEPHONE CALL: 4700 BRYANT. CABLE ADDRESS: STRYJOURN, NEW YORK.

HENRY W. BLAKE, Editor.

L. E. GOULD, Western Editor.

Associate Editors:

RODNEY HITT, FREDERIC NICHOLAS, WALTER JACKSON.

News Editors:

G. J. MACMURRAY, FRANK J. ARMEIT.

CHICAGO OFFICE.....1570 Old Colony Building

CLEVELAND OFFICE.....1015 Schofield Building

PHILADELPHIA OFFICE.....Real Estate Trust Building

EUROPEAN OFFICE....Hastings House, Norfolk St., Strand, London, Eng.

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Starting the Association Year Promptly

Active work has already been begun on preparing for the 1911 convention. As chronicled in our issue of last week, the new officers and executive committee of the American Electric Railway Engineering Association held a meeting Nov. 15 to decide upon the number of committees which would be required to carry on its work during the year and to select the topics which they are to consider in their reports. The new officers and executive committee of the Transportation & Traffic Association held a similar meeting on Nov. 22. Another radical departure made by the American Electric Railway Engineering Association this year is to require all committees to have their reports in the hands of the secretary by July 15, instead of Aug. 1, as previously. This is a good start and promises well for the future.

The Subway Deadlock Is Broken

The proposal of President McAdoo of the Hudson & Manhattan Railroad to operate an amended tri-borough subway system projects a new element into the acute New York City subway situation. It has had the wholesome effect of breaking the deadlock which had developed between the Interborough Rapid Transit Company and the New York Public Service Commission for the First District and of arousing public interest in the enormous outlays of capital required for transit development. The Interborough company will prepare new terms on which it will extend its system, and until the commission analyzes the McAdoo offer no further steps will be taken regarding the original tri-borough subway plans. Although the New York newspapers are not unanimous, public opinion generally appears to like the tone of the proposal made by Mr. McAdoo. A statement of the terms offered, published in another part of this issue, makes it plain that protection of the private capital is an essential provision of the arrangement. Taxes and interest on \$50,000,000 or whatever sum is required for the construction of the Grand Central extension and for the equipment of the system are to be first charges on the net earnings from operation. Interest on the money expended by the city for construction is to be a second charge. It is evident from all the signs, including the attitude of Mayor Gaynor, that careful consideration of the entire situation will precede any formal action on contracts by the city's Board of Estimate and Apportionment.

Discussion of the Interurban Rules

One of the most important subjects before any of the associations this year is the revision of the standard code of interurban rules by the Transportation & Traffic Association. The present standard code, that adopted at Denver in 1909, is not considered perfect even by its warmest advocates, and has

been seriously criticised by a certain number of electric railway managers who think that a code more nearly corresponding with that of the American Railway Association would be far preferable. It was the general expectation that those who believed in the radical revision of the code would present arguments in favor of their position at the recent Atlantic City convention, but the code was referred back to the committee with practically no instructions as to the direction in which the association wished the code changed. As a result the committee is in the dark as to the general policy which should govern the proposed revision of the rules, and the interurban railways throughout the country are uncertain whether sentiment as a whole prefers minor or radical changes in the code. To assist the committee in its problem J. W. Brown, one of its members, urges a discussion of the subject, and we shall be glad to give space to any letters which may be sent to us on the subject which will assist in reaching a decision. Mr. Brown emphasizes a point which is often forgotten in a discussion of this kind. This is that it is not the purpose of the committee to formulate a code which will meet all of the varying conditions which obtain on widely dissimilar properties. Indeed, such a result could hardly be effected. Rather it is the duty of the committee to furnish a basis upon which local rule books may be founded and to which exceptions and additions can be made by individual companies. We trust that the discussion will be along these lines.

A Substantial Development

The completion of 50 years of operation of the Montreal Street Railway occurred coincidentally with the surrender of control of the company to new interests. It was therefore opportune and appropriate that the last annual report should have contained a brief history of the development of the property under the administration of the interests which controlled its affairs for so many years. An abstract of the history, published in the issue of the *ELECTRIC RAILWAY JOURNAL* for Nov. 12, 1910, emphasized particularly the remarkable progress of the system since the adoption of electricity as a motive power in 1892. The increase in earnings has far outstripped the increase in the number of people in the city of Montreal and its suburbs and represents a decentralization of population which was certainly made possible only by the introduction of rapid transit and the extension of railway lines into outlying districts. In 1891 the city of Montreal and its suburbs had a population of 261,302. After 31 years of existence with horse power the company, according to the historical statement, had in operation in 1892, the year when the work of electrification was started, a total of 12½ miles of track. Gross earnings in the 1892 fiscal year were \$564,407. By 1901 the population of the city and suburbs had increased to 376,402, a gain of 44 per cent. In the fiscal year 1901 the company earned gross \$1,900,680, a gain of 237 per cent over 1892. It operated in 1901, according to *AMERICAN STREET RAILWAY INVESTMENTS*, about 100 miles of track. The population of the city and suburbs of Montreal in 1910 is estimated at 600,000, an increase of 59 per cent in nine years. During the same period the gross earnings of the company increased 129 per cent, amounting in the 1910 fiscal year to \$4,352,551. The company operated 144 miles of track at the end of last year, exclusive of subsidiary companies. A calculation of the gross earnings per capita is rendered inexact for the earliest year given because of the absence of

figures for like years. If we use the population of 1891 and the earnings of 1892 the average gross revenue per capita was \$2.16. In 1901 the average was \$5.05 and in 1910, with the population estimated, it was \$7.25. This is a substantial development.

THE CONDITIONS OF ELECTRIFICATION IN BOSTON

We published last week an abstract of the reports made upon proposed electrification around Boston, together with a brief editorial summary. It is worth while perhaps to look at somewhat greater length into the special conditions which there exist in order to form some adequate idea of the real situation at present. As is well known to our readers, the railroad corporations operating within the Metropolitan District of Boston were required by the Legislature to prosecute studies with reference to the electrification of their passenger services within this district and to present reports upon such work. Now, it quite goes without saying that any reports presented under duress of this kind were morally certain to be adverse, as they have proved to be, since not even the most amiable railway company can be expected to minimize its difficulties when a large possible expenditure confronts it. It is well, however, to look into the circumstances which would attend electrification around Boston with the view of pointing out some of the difficulties and some of the favoring factors to which perhaps too little weight has been given in the present report.

Boston is served by three railway systems, one of which, the Boston & Maine, now leased by the New Haven Railroad, enters on the north; another, the old Boston & Albany line, now leased by the New York Central & Hudson River Railroad, on the west, and the New Haven Railroad proper, which serves the south and west. Each conducts a large and important suburban service in addition to through service. The entrance to the city on the north is fairly free; that on the south and west is at one point well within the city very much cramped, inasmuch as the Boston & Albany system and that part of the New Haven lines which passes through the Back Bay Station have far too little track room for the heavy traffic conducted. These systems are the ones upon which the necessity for electrification is the most acute since the South Station and its approaches come well within the densely populated part of the city and lie along lines which make the smoke nuisance reach its maximum. The Boston & Maine system, on the other hand, comes in over the waterways from the north without great crowding of the tracks and without running for any considerable distance through densely populated and thickly built territory. On the north, therefore, the operation of the system by steam is much less of a nuisance than on the south and the terminal conditions are upon the whole much easier.

The total number of passengers handled at the North and South stations respectively is about the same, about 25,000,000 a year in each, representing both local and through traffic. The lines from the two stations after getting out of the immediate city spread like the ribs of a fan, taking up the suburban districts, and the total mileage involved becomes rather large. The New Haven lines aggregate about 238 miles, the Boston & Maine about 224 miles and the Boston & Albany lines about 128 miles, when the electrification is carried out somewhat beyond the Metropolitan District to South Framingham, which seems to be the logical terminus for an electrical service. Altogether about 590 miles of single track are involved in the electrification

district, an amount relatively very large considering the traffic, which one may roughly estimate at about 100,000 per annum per mile of track to be electrified. This ratio is upon its face somewhat unfavorable when one considers that under the estimates given the cost of electrification amounts to about \$66,000 per mile. Particularly is this the case when one remembers that the bulk of the area considered lies within a 10-cent fare limit on the electric lines now serving parts of the same territory.

On the other hand, considering the nature of the service over a large part of this territory, an average of \$66,000 per mile for changing to electricity, including equipment, is a figure which strikes one familiar with the operation of suburban and interurban electric lines as enormously high, and universal experience in the operation of such lines near large cities indicates that the passenger traffic on an existing steam line is far less than that which would be obtained if the line were electrically equipped. This, of course, has not been taken into consideration in the necessarily somewhat cursory investigation made by the railroads concerned. As a general rule figures made from the steam railroad standpoint upon electrification would differ radically from those presented by expert electric railway operators confronted with the same traffic problem. In the one case provision is made for maintenance of steam railroad conditions in the electrified system, while in the other case estimates are based on intimate knowledge of normal railway conditions given the advantage of splendid roadbed and private right of way. From this viewpoint the electrification of lines in the district which we are considering would present two quite distinct problems: First, the terminal electrification for handling through traffic by electric locomotives within the area affected. Second, the conversion of the suburban lines into first-class electric roads for the class of service undertaken.

Until the proposed electrification is taken up from the electric railway manager's point of view it is perhaps premature to pass judgment on its financial outlook or to indorse the intimations conveyed by the railroad systems concerned, that electrification would of necessity imply considerably increased passenger charges.

We would like, for example, to see worked out by the experience of the Boston Elevated Railway Company a scheme for the inclusion of the Albany circuit, which carries suburban traffic to the westward, from the standpoint of an efficient auxiliary to its own lines. The Boston & Albany Railroad figures out that it is actually losing money on its total service within the zone to be electrified under the present conditions of steam operation, but we have strong inclination to the belief that if this service could be turned over to a skilfully managed electric railway organization familiar with the problems involved it could be electrified and be made to show a good profit. Similar conditions hold in other parts of the Boston suburban system. One can readily pick out from this system lines which evidently are now run at a loss which as electric lines could in all probability be made traffic winners to an extent which would set the balance sheet right. In some of these instances, as in the Albany circuit, it might not be a bad idea for the roads now losing money on them to see if some equitable leasing arrangement could not be made by which lines could be operated electrically with returns to the present owners at least on the right side of the ledger.

We have consistently maintained through the whole period of discussion about electrification that successful electrification in-

involved much more than the substitution of motive power in an existing steam service. It includes both the handling of trains by electric locomotives and the conversion of subsidiary suburban lines into well equipped and operated electric roads, such as almost universally offer opportunity for profitable operation. There is at present almost universal complaint on the part of steam roads that their suburban services do not pay. On the other hand, it is well established that electric suburban lines with termini in large cities tapping a populous suburban district pay and pay handsomely. It would seem wise therefore not to consider the subject of the Boston electrification as a closed issue, but to have it more thoroughly worked out, especially with reference to individual suburban lines, as indeed Mr. McHenry suggests, with a view of seeing whether the actual conditions may not prove to be more favorable than appears in the report on the entire system.

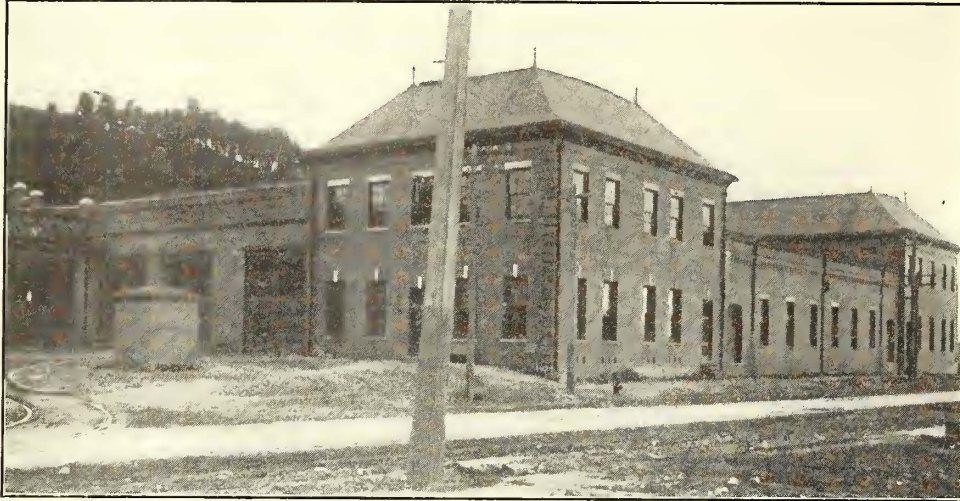
REWARDING MOTORMEN FOR SAVING POWER

The saving of power through devices for checking the operating characteristics of motormen is as yet a new subject in this country, but it may not be premature to consider how the motormen themselves may be induced to co-operate with their employers for this purpose. Whatever may be the comparative merits of wattmeters, ampere-hour meters, current clocks and coasting clocks, the maximum benefits from their use cannot be obtained unless the men are educated to regard them as something else than automatic spies. Such a favorable mental attitude can be secured only when it is made clear to the men that the device helps to distinguish the careful from the wasteful motorman, and to bring merit prominently before the management. Since a number of American electric railways are beginning to install current-checking instruments it may be interesting to summarize the treatment accorded to their employees by the numerous Continental street railways which have had several years' experience with this problem. From a recent report to the International Street & Interurban Railway Association it appears that some of the companies rely for good results merely on disciplining the men by obliging them to take further instructions, by posting comparisons in the car houses, or even by threats of dismissal. Others advance the period when a man's pension privileges go into effect. But apparently the most satisfactory method is to present bonuses or to promote the leaders to the position of motorman instructor. One company divides into three grades all men who have worked at least 22 days in the preceding month. These divisions are based on the percentage of power saved within certain limits. The men in the first class receive almost an hour's pay for each day of service in addition to their regular wages; those in the second class receive 20 per cent less, and those in the third class receive 40 per cent less than the first-class men. There is no question that some such plan of rewarding the motormen is desirable, because the chances for promotion from the ranks are comparatively few, and even if they were not, the best motorman would not necessarily prove an equally reliable instructor or inspector.

It is impracticable to increase the wage rate indefinitely merely on the basis of seniority, but a monthly bonus for good service is an incentive which helps the best motormen to earn more money whether they have or have not reached the wage limit for length of service.

REPAIR SHOP PRACTICE OF THE PORTLAND RAILROAD COMPANY

One of the most extensive electric railway repair shops in New England is the installation of the Portland Railroad Company, at Portland, Maine. Although the shops were erected several years ago their design and equipment have proved to be so well adapted to the maintenance requirements of the system

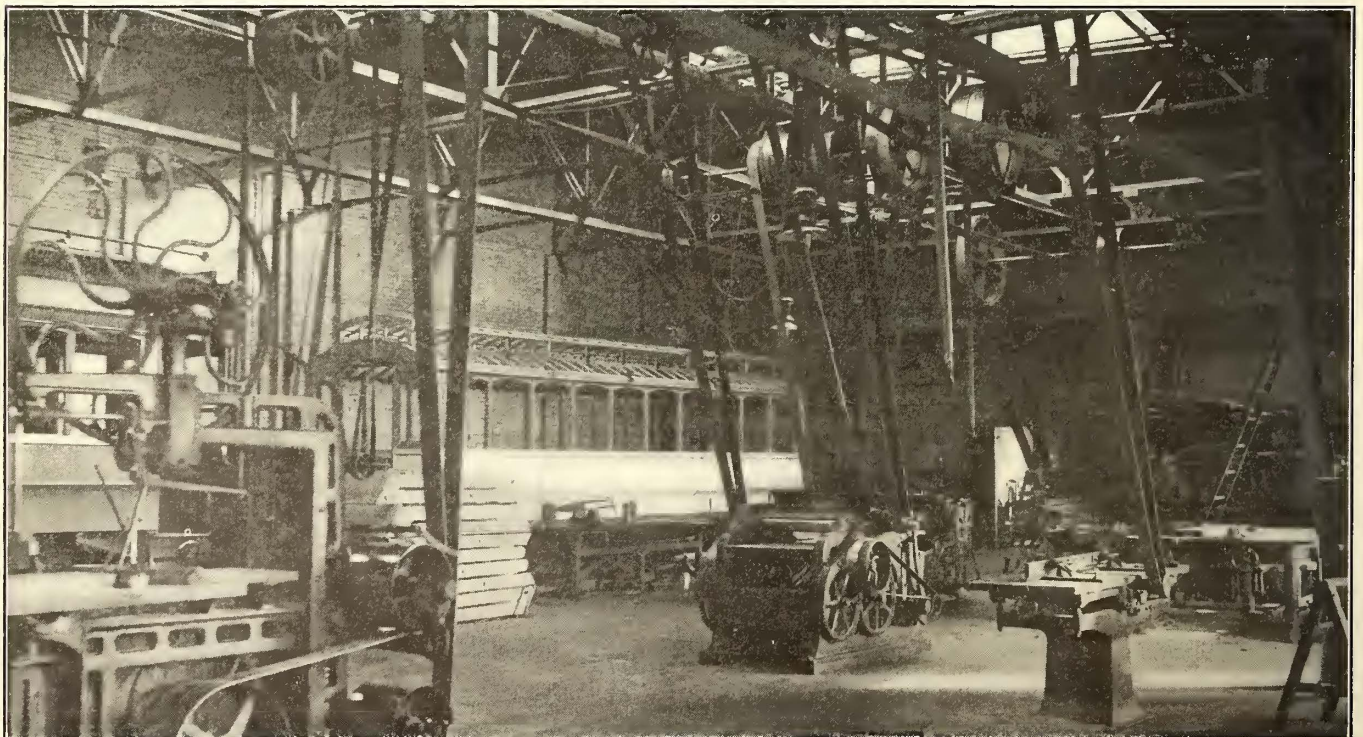


Portland Shops—Exterior of Repair Shops

that substantially no rearrangement of departments has been necessary, and the initial equipment has largely sufficed. New storage and stockroom facilities have lately been added, and the shops illustrate in a marked degree the advantages of concentrating repair work on a medium-sized system, leaving only emergency adjustments and replacements of a lighter character

the business center of the city. The plant was designed by the engineering firm of Sheaff & Jaastad, Boston, during the administration of the late E. A. Newman, who preceded W. F. Berry as general manager of the company. In general, the buildings are of brick and steel construction, with concrete foundations and steel roof trusses for all departments. Adjoining the shops are the principal storage car houses of the system in the city, the latter being of the same general design as the former. Special attention was given to fire protection in the construction of the plant. All departments are equipped with a sprinkler system installed by the General Fire Extinguisher Company, of Providence, R. I., the water supply being taken from a 10,000-gal. wooden tank carried on a steel tower in the yard between the car house and the shops. The property is well equipped with hydrants, hose and chemical extinguishers, city water service, telephone and fire-alarm facilities, a special alarm box being located in the yard. All departments are provided with interior telephone connections with a special button for making calls on the local Bell system. In departments where the work is so noisy as to

interfere with telephoning sound-proof booths have been built by the company, a favorite method of construction being the use of discarded end doors of closed cars. In one instance a locker booth is employed. Brick fire walls 16 in. thick separate the various divisions of the shop, the partition walls being carried 2 ft. above the roof level in the majority of cases. Self-



Portland Shops—Carpenter Shop Showing Closed Car Under Construction by Company.

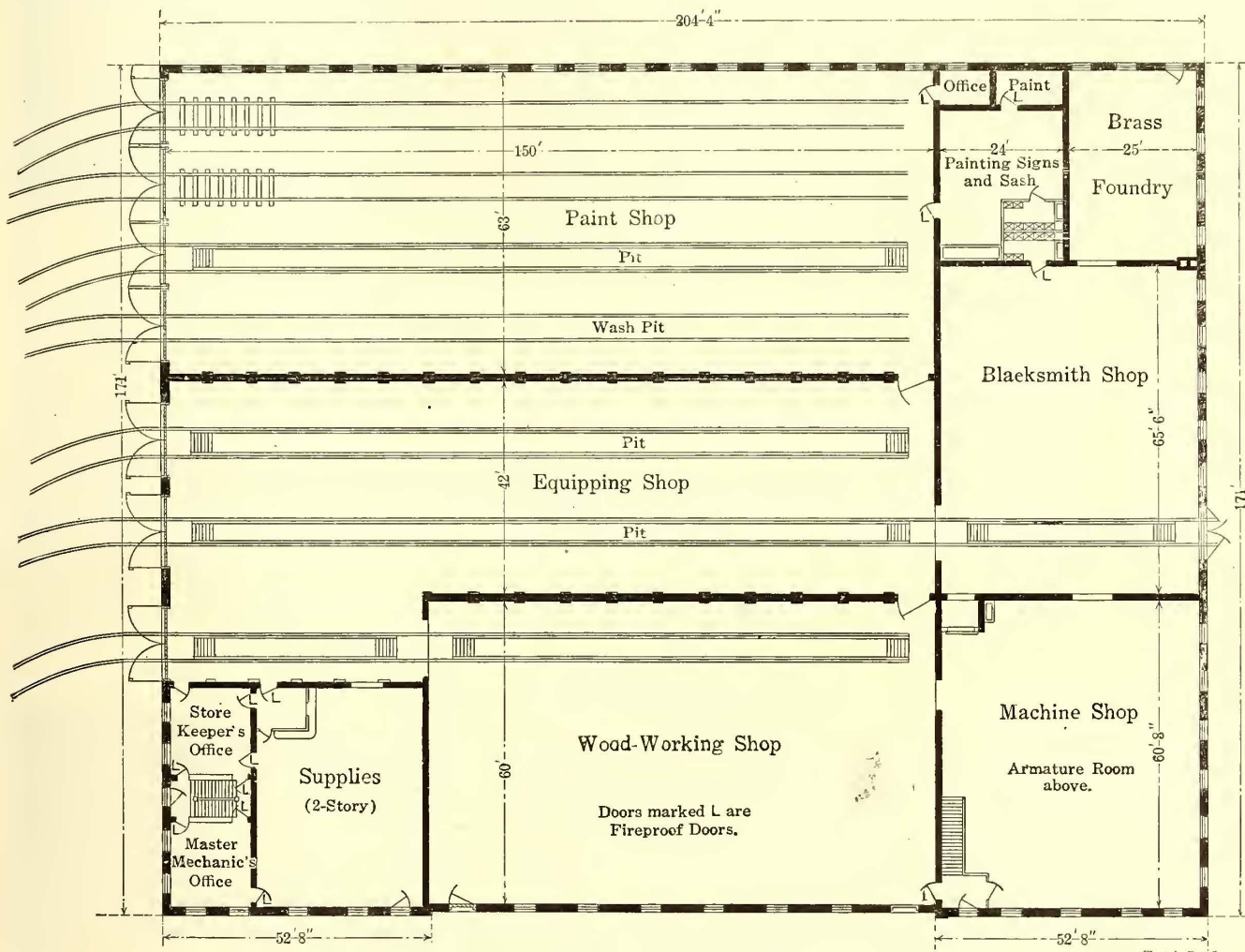
to scattered car houses. Routine inspection and cleaning are performed at all the company's car houses and division headquarters, but practically all important repairs are executed at the main shops.

The shops are situated at the base of the Western Promenade, on St. John Street, Portland, adjoining the main line of the Boston & Maine Railroad and approximately 2 miles from

closing, metal-lined doors are used throughout. The floor construction consists of granolithic material on one-story sections and slow-burning wooden flooring in the portions of the shop where two stories are built. At each end of the shop building is a two-story section, containing offices for the master mechanic, stockroom, an upholstery room and armature-winding department, with machine shop below the latter.

The shop property is about 205 ft. x 171 ft. in dimensions and has repair facilities for about 250 cars. The general arrangement consists of a narrow yard connected with the street tracks by a short curve, from which branch tracks are carried into the building in seven parallel lines. At the front of the shops are the paint shop, washing facilities for cars, equipping shop and office section, with a stockroom behind the latter 50 ft. long, 43 ft. wide and 16 ft. high. The interior tracks are carried in each case about 140 ft. into the shop building and terminate in front of a fire wall separating the sections where larger work is performed from the machine shop, blacksmith shop, minor painting and fitting quarters. Behind the stockroom and office is a carpenter shop served by one of the interior tracks, and at the rear of the latter is a general machine shop. The blacksmith shop is located at the rear of the paint and equipping departments and is served by an ex-

ing provided. The paint shop is provided with five monitors. The company coats the glass in each every spring with a thin glazing of oil paint. This keeps the sun out in the hot season, and at the same time washes out by fall, leaving a clear glass in the winter, when the warmth and the light of the sun are most needed. Three ventilators are installed in each of the paint shop skylights, the latter being of ribbed glass construction. The natural illumination of the carpenter and equipping shops is gained chiefly through similar skylights. Both arc and incandescent lights run off the railway circuit are utilized in the shops. General illumination in the paint shop is secured by arc lamps of the inclosed type with diffusing reflectors, and the woodworking division is similarly equipped. In the machine and armature shops incandescent lamps, wired either singly or in clusters, are employed more generally. The use of a concrete floor in the paint shop aids materially in the dis-



Portland Shops—Plan of Shops

Electric Ry. Journal

tended track which has proved of great convenience in the handling of trucks. The tracks inside the shops are from 15 ft. to 18 ft. apart on centers, and the provision of this space has greatly facilitated rapid painting and general maintenance work. Pits are installed beneath the tracks in the carpenter and equipping shops, and one paint shop track is provided with a pit. The pits are carried throughout practically the entire length of the track, and a pit is built under the track which is carried into the forge shop. At fire doors the trolley is discontinued on each side of the wall. The general shop arrangement is characterized by very short runs between departments, and the operating convenience of the shops is unusually noticeable. Large doors are provided in the carpenter and blacksmith shops to facilitate the entrance and egress of supplies.

LIGHTING AND VENTILATION

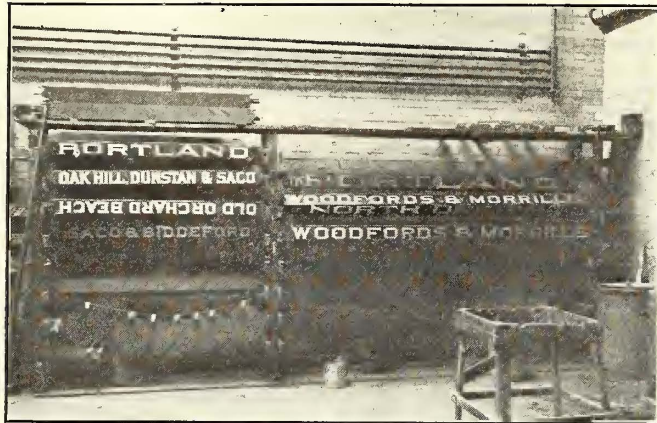
The natural lighting facilities of the shops are excellent, a liberal apportionment of both side and skylight equipment be-

tribution of light. Four inclosed arc lamps are in service in the carpenter shop for night use, and incandescents are used at benches and for localized illumination. The walls are painted a light yellow with a dark green border extending 5 ft. above the floor, and the working space between the track and the division wall is lighted by a row of 16-cp incandescents hung one from each truss and 9 ft. apart. Two inclosed arc lamps are provided in the general machine division. The blacksmith shop is lighted by three inclosed arc lamps and numerous incandescents for local service. In the equipping division and in pits lighting circuits are installed with plug connections so that portable lamps may be cut in wherever desired. At the end of the paint shop is a sign and sash room, 24 ft. x 32 ft., provided with an inclosed arc lamp and large skylight.

HEATING

The shops are supplied with steam heat from a central boiler plant serving the entire property. This contains three hori-

zontal return tubular boilers rated at about 50 hp each, the steam usually being supplied at from 1 lb. to 5 lb. pressure. The service for the repair shops is brought over by an insulated 10-in. main carried in a riveted steel framework which spans the entire distance between the shops and the car house section, the boilers being located in the latter portion of the property. Direct radiators are used for the heating of the office section, but in general the various departments are heated

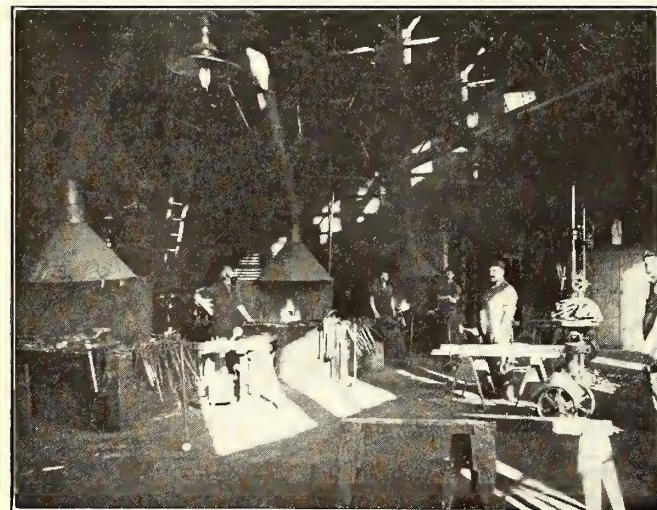


Portland Shops—Storage Racks for Car Signs in the Paint Shops

from sets of horizontal pipe coils carried along the walls at a height of about 10 ft. from the floor.

LOCAL TRANSPORTATION

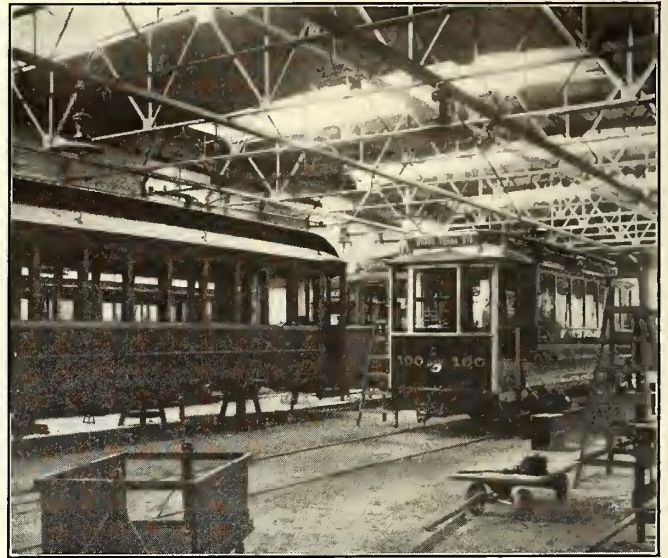
Unusual care was taken to provide adequate transportation arrangements between different departments, so that heavy work need not be delayed in progress through the shop. The equipping shop is provided with four hand hoists of 4 tons capacity each installed on runways so that they sweep the entire division longitudinally. The hoists are carried on travelers suspended from wheels which run on longitudinal girders without interfering with the movement of trolleys. By means of this equipment the use of jacks is unnecessary in handling car bodies when the latter are freed from their trucks, and assembling or dismantling is much facilitated. The benefits of overhead hoists on runways have been recognized in other departments as well, a 2-ton outfit being installed to operate



Portland Shops—Blacksmith Shop

between the blacksmith and the machine shops, connecting the extreme ends of each department and serving floor space not reached by the longitudinal tracks. The fire doors between the two shops are cut away for the runway girder, but the clearance is made close to avoid drafts in case of fire. A Morse-Williams electric elevator is installed to connect the machine shop and the armature department on the floor above. The elevator platform is about 7 ft. x 5 ft. in dimensions, and the

drive is by a 10-hp, 550-volt motor. The blacksmith shop is also served by this elevator, and tinned doors are installed for fire protection. The machine tools in the general repair section



Portland Shops—Paint Shop; Window-Glass Truck in Foreground

are served by the same hoist that is used to convey material between the blacksmith and machine shops. Local transportation within departments is further facilitated by the use of hand trucks, notably in the paint and armature shops. In the former a truck is fitted up in the form of a cabinet, containing various drawers and compartments so that enough painting equipment for the needs of an entire car can be readily moved about the shop without the necessity of frequent trips to and from the stockroom. Another portable truck is provided with grooved slides on its upper portion, so that all the window panes required by a car can be kept conveniently at hand. The armature trucks consist of wooden frames supported on a pair of wheels, with wooden handles and wrought-iron braces, the framing being notched conveniently to receive the shaft.

WOOD-WORKING SHOP

The wood-working shop contains a circular and split saw



Portland Shops—Stock Room

bench, band saw, jointer, cutting-off saw, grindstone, mortising and basing machine, shaper and irregular molding machine, planers and lathes, all group-driven by a 30-hp, 550-volt direct-current shunt motor. The motor is controlled from a starting panel mounted near the floor level, the motor itself being on timber framing near the machine-shop doorway. The starting panel contains an ammeter, knife switches, Chase-Shawmut fuses and automatic release circuit-breaker and start-

the wall. Sixty-four signs can be stored in a space 16 ft. long, 32 in. wide and 7 ft. high. Adjustable racks are also provided in this room for window-sash storage, and on one side a sink, with steam and hot-water connections, is in use, the sink being of a size capable of holding car doors. The window-sash car has a capacity of 2000 lb. of glass and fittings. Car steps of the open type are painted by dipping them into troughs of black varnish, extra troughs being provided for dripping service. The company has given up the practice of using brushes fitted with kerosene oil reservoirs to allay dust, on account of its inconvenience.

ARMATURE ROOM

The armature winding department is equipped with banding and field coil winders and an engine lathe, group-driven by a 5-hp motor mounted on the floor. A 1-ton hand hoist is provided for local transportation, and the department has recently been equipped with a drying oven 6 ft. square and 4 ft. high, made of sheet iron $\frac{1}{8}$ in. thick, and set on an insulating plate of sheet iron and asbestos $\frac{1}{2}$ in. wide. Four electric car heaters are used in the oven, and these are wired to switches so that three heats can be applied. The maximum current consumption is 10 amp at 550 volts. In this department a simple method of testing is practised by the use of incandescent lamps arranged in a group of five in series. Taps are taken off the terminals of one lamp, all the lamps being on a single portable baseboard. When the five lamps are in series the full line potential of 550 volts can be obtained at the terminal of the one with the taps, if the bulb is unscrewed, while screwing in the bulb gives a potential of 110 volts over the lamp terminals.

STOCKROOM

The stockroom is provided with an installation of 1000 storage bins arranged in tiers along the walls and in the center of the room. Each bin is numbered progressively, beginning with 1200 on the first tier, 2000 on the second and so on up to 10,000. The number of the tier and the row is indicated by the bin number. Portable drop lights of 16 cp each are installed between the tiers, and three portable wooden ladders attached to overhead runways are in service so that all parts of the stockroom can be reached with minimum trouble. The stockroom is in charge of a clerk who is on duty from 7:30 a. m. to 5:30 p. m. week days. Each of the bins is provided with a card label on the front, set in a tin frame costing \$3 per hundred. The card gives the number of the bin, the article, its size and any further data necessary. All stock is delivered on the basis of car numbers, accounts of the work being kept for each piece of rolling stock. The forms used are of a simple character, consisting of a department foreman's requisition on the stockroom, an order blank to a department foreman for the manufacture of special parts and spare equipment, car house slip showing to what operating point material goes, and a record of the progress in spare part manufacture.

COMPANY MANUFACTURES

The company makes brush springs, motor bolts, cash register springs, deck sash openers, release spring hooks, door handles and other minor car fittings, the patterns being made in the carpenter shop and cast outside. Castings are brought into the machine shop for final tool work and assembling. The company manufactures a motorman's seat in its own shop, consisting of a turned wooden stool top attached by a U-spring to a $\frac{3}{4}$ -in. steel rod bent in the shape of a letter "C" at the top and carried downward in a straight line to a floor socket 3 in. deep, the rod being recessed into the socket. The seat spring is 1 in. wide and $\frac{1}{8}$ in. thick. Two clamps are provided so that the seat can be adjusted horizontally and vertically, and the simplicity of the device, as well as its comfort, has decided the company to manufacture a considerable number. The motorman simply lifts the seat out of the socket on arriving at the end of a route, and no space is occupied by a permanent end seat which is normally in use only half the time.

The company manufactures passenger and express cars in its own shops when the pressure of routine work relaxes. The standard passenger car is built with a 28-ft. body, has longitudinal seats and double trucks. Of the 210 cars now in

service on the system about half are of the single-truck type. In the summer season the company takes off two of the four motors used in winter service on each closed car. It is now using a leatherboard headlining in place of veneered wood, and finds the moisture-proof qualities much improved.

The standard wheel used on the system is 33 in. in diameter, of cast iron. A few steel wheels are being tried in service at present, the company turning its own steel wheels when necessary, although the facilities for this work are not as yet satisfactory for rapid production. The wheels are taped to within $\frac{1}{32}$ in. in circumferential measurement in the effort to produce similar dimensions. The standard axle is $4\frac{1}{2}$ in. in diameter and the axle-bearing journals are $\frac{3}{4}$ in. in diameter and 7 in. long.

Three Ridlon babbiting devices are in service in the shop, and the company turns its bearings before assembling them on the cars. All brass and iron castings are made outside.

About 45 men are employed in the repair shops. Time is kept on cards, showing the number of each man, his rate, the date, name, car number for which the work is planned, character of the work, hours spent upon it and the total amount due. These cards are signed by the department foreman after being passed through a recording clock supplied by the International Time Recording Company. C. P. Garland is the master mechanic of the company.

HEARINGS ON COMMUTATION RATES

Hearings in regard to the increase in commutation rates put into effect recently by the Pennsylvania Railroad, the New York, New Haven & Hartford Railroad, the Erie Railroad and other railroads operating into New York were held in the Waldorf-Astoria on Nov. 16, 17 and 18, 1910, before John M. Harlan, of the Interstate Commerce Commission.

On Nov. 16 the hearing was confined to the presentation of testimony by officials of the Pennsylvania Railroad. J. G. Rodgers, assistant general manager of the company, offered figures showing increase in wages for the decade which ends this year and the increase in the cost of fuel and equipment and the rise in taxes. The commuter to New York is hauled on the average 14 miles. Previous to July 20, 1910, the company received 11 cents for this service. It now receives 13 cents. The cost for each commuter in train expenses, according to Mr. Rodgers, was 9.13 cents, the cost to pass him through the Jersey terminal was 6.86 cents and the cost to ferry him to New York was 2.28, making the loss to the company 5 cents. In short, the railroad contributed to each commuter a portion of each fare received from a through passenger, the commuter paying barely more than the cost of passing him through the Jersey City Terminal and over the Hudson River.

R. H. Wallace, general passenger agent of the Erie Railroad and the New York, Susquehanna & Western Railroad, was the principal witness on Nov. 17. He did not know the financial condition of the road before the changes in the commutation rates were made in July, 1910, but the expense of conducting the commutation business was greater than the returns. He thought that in the case of sections where the cost of the road was higher than in others the rates should be proportionately higher. This was not possible, however, as a compensatory rate would make the commutation rate prohibitive. The making of improvements was one of the considerations which influenced the increase of rates. Commuters should bear the same proportion of terminal charges as other passenger business. It was necessary for the road to increase its revenue in order to better its facilities.

L. F. Vosburgh, general passenger agent of the New York Central & Hudson River Railroad, testified on Nov. 18, 1910, in regard to the business of that company in transporting commuters over the West Shore Railroad. At this hearing considerable testimony was presented on behalf of the commuters regarding the effect which the increases in rates on the various roads has had on the development of the towns which the roads serve. Briefs will be submitted to the commission in January.

MEETING OF RAILWAY COMMISSIONERS

The twenty-second annual convention of the National Association of Railway Commissioners was held at the headquarters of the Interstate Commerce Commission, Washington, D. C., on Nov. 15 to 17. Representatives of the Interstate Commerce Commission and of nearly all of the State railroad commissions were present.

Officers were elected for the ensuing year as follows: President, R. Hudson Burr, Florida Railroad Commission; first vice-president, Charles F. Staples, Minnesota Railroad & Warehouse Commission; second vice-president, O. P. Gothlin, Railroad Commission of Ohio; secretary, W. H. Connolly, Interstate Commerce Commission; assistant secretary, William Kilpatrick, Illinois Railroad & Warehouse Commission.

The next meeting will be held in Washington, D. C., on Oct. 10, 1911.

The committee on accounts and statistics of electric railways had no report to make at this session.

SAFETY APPLIANCES AND INTERURBAN ACCIDENTS

William Kilpatrick, secretary Illinois Railroad & Warehouse Commission, presented the report of the committee on safety appliances. An abstract follows:

"At the last session of the Congress important action was taken looking to an increase in safety of railway operation. This action is represented by two measures, one providing for the standardization of railway safety appliance equipment, and another act providing for the investigation of railroad accidents by the Interstate Commerce Commission.

"Serious collisions, accompanied by great loss of life, have recently occurred upon interurban electric lines. The rapid development of these lines during the past few years has emphasized the unsafe methods under which they are operated. The interurban lines now carry a considerable percentage of the passenger traffic of the country, and it has become necessary in the interest of public safety that they be placed under regulations with respect to train operation fully as strict as are the regulations applying to steam railroads. Moreover, as these lines are largely intrastate in character, their regulation can only be properly effected by the States. Up to the present time no proper methods of inspection nor adequate systems of rules looking to the safety of train operation have been applied to these roads. The personnel of these lines is very much less efficient than the personnel of steam roads, and both motormen and conductors are employed who are without railroad experience and have no proper sense of the responsibility connected with their employment or the importance of the duties they are called on to perform.

"The rules and regulations governing the movement of trains on these lines are in many cases also crude and ill constructed. It would seem the part of wisdom for this convention to go on record as favoring a uniform system of standard rules and regulations for interurban lines and recommending that the block system be absolutely required. The arguments for the use of the block system on steam roads apply with much greater force to electric lines, where discipline is more lax and deficiencies in personnel are greater than upon steam roads. On steam railroads before a man can be placed in charge of a train he must have had several years' experience in train service. He must also pass a thorough physical examination, both with respect to his hearing and eyesight, and to his general physical soundness, before being employed in any capacity in train operation. The same system should apply to electric roads.

"In considering matters that will tend to lessen dangers incident to train operation the committee does not wish to confine itself purely to mechanical safety appliances.

"For many years the American Railway Association, a body of men composed of the highest officials of the principal railroads of the United States, has been endeavoring to standardize the rules and regulations governing the movement of trains, but with only partial success. It is true the work which that association has accomplished has been of incalculable value, and

the standard code of train rules is recognized in a greater or less degree by all lines, but only on a very limited mileage are these rules in force in their complete form.

"These rules have been adopted by a large majority of the railroads of the United States, at least in part, but it will be found that on almost every railroad, and, in some instances on separate divisions of the same road, a few or many of the rules differ from the standard.

"Now, it would certainly seem that no more beneficial safeguard to trainmen and the traveling public could be devised than the adoption and enforcement of a uniform set of standard rules, so that on all railroads in the United States each signal would mean exactly the same thing.

"The safe operation of trains largely depends upon the training of the men to perform automatically certain duties in certain specific emergencies. Trainmen are more or less possessed with wanderlust, the nature of their work and easy means of transportation encouraging such desire for change. Comparatively few can be found who have worked for one system only. Some few rules are almost universally the same on all roads, but many of the rules and regulations which every road must have are not; consequently men changing from one system to another are constantly met with deviations in varying degrees from the standard; and there is always this additional unnecessary risk, that, in the confusion of an emergency, a man may do something that would be perfectly proper under the circumstances on some other line, but would result in loss of life and property on the road by which he is then employed. This is so plain to the practical railroad man that the necessity for absolute uniformity of rules governing train movement really needs no explanation. The difference between two railroad systems may be only slight, yet sufficient at some time to cause disaster. As long as trains move along on time, without obstruction, the dissimilarity of rules makes little difference, but when emergencies arise and men are working under pressure and excitement, at the very time when most important that all understand their instructions alike, they are liable to confuse or forget the proper thing to do unless their training has been along uniform lines.

"The Interstate Commerce Commission and many of the State commissions have men whose duty it is to see that the laws requiring uniformity of appliances for cars, such as automatic couplers, grab irons, ladders and other devices for the protection of the employees are enforced, so that now practically all cars are uniformly equipped. This, however, is only the mechanical part, and, if omitted entirely, would result in individual loss of life or limb, while a lapse of memory on the part of an employee accustomed to working under a different set of signals might mean a disaster involving the lives of hundreds and the destruction of thousands of dollars' worth of property.

"A road can be fined for having a drawbar lower or higher than a certain number of inches from the top of the rail, but there is no penalty for the failure of a brakeman properly to protect the rear end of a train occupied by hundreds of passengers; if his superior discovers his delinquency he may receive a few 'brownies' on his record, or, in extreme cases (generally after an accident), he may be discharged. And yet the obstacles to be overcome in enforcing uniformity of rules would be as nothing compared to the standardizing of equipment and there would be no large sums of money to be spent in the change. No additional burdens are placed on the carrier, the rules for the small line apply as well to the large systems, double-track lines are provided for, and an efficient employee of any line is immediately available for a similar position on any other line.

"The American Railway Association, while recognizing all of the above facts, has been unable to standardize for the very reason that it is without power to enforce, but can only recommend, even to roads members of the association.

"If this association would also go on record as favoring the enactment of such a law by Congress, it would be very helpful in securing this much-needed legislation.

"The state of development that devices for automatic control of trains have reached is nothing short of marvelous when we take into consideration the fact that this development has been reached not only without the co-operation of the railroads, but in the face of their active hostility. This development has undoubtedly reached its limit without extended use on railroads, but given that service which is the only means by which they can be developed beyond their present state there can be no doubt that they will rapidly develop to meet all possible contingencies of exacting railway conditions.

"Neither the public nor the railroads will get the benefits of automatic control of trains until its use is made mandatory by Congressional enactment, without which the Block Signal and Train Control Board can go on testing and reporting on various systems for an indefinite period and the state of the art will remain right where it is now and the railroads will have killed and crippled an army of our people. It is time for Congress to act. There are ample data upon which to base such action, and delay means a fearful cost in lives and money.

"This association should pass resolutions at this meeting calling upon Congress to take prompt action for the compulsory use of automatic control of trains. Such an act would, in reality, become an enabling act for the railroads, as it would and should of necessity grant a period of years in which to complete the equipment, the same as was done with the automatic couplers and air brakes, fixing a certain percentage annually. This is due the railroads to insure against excessive damages for accidents happening on portions of their road not equipped during the period of installation, provided they install in accordance with the prescribed period which Congress may designate."

The report was discussed by representatives of several commissions. J. C. Sullivan, Ohio Railroad Commission, said that he was a member of the committee and that he did not sign the report for the reason that there was criticism of the interurban lines which to a certain extent, so far as his State was concerned, he did not think was justifiable. A standard code of rules had been formulated in Ohio and since that time the roads had been going along fairly well.

J. C. Lawrence, Washington Railroad Commission, said that the Washington Water Power Company had installed, in connection with an electric automatic signal system, an automatic train control with an automatic stopping device and put it into practical effect at considerable expense.

John F. McClure, Indiana Railroad Commission, said that he thought the report should not be adopted in the form in which it was read. Recently there occurred two very disastrous accidents on interurban railroads in Indiana. In each instance the cause of the accident was the inefficiency of the men in charge of the cars, or at least one of the cars, that were in collision, due to the fact that they overlooked their orders or disobeyed rules. In the investigation, the commission ascertained that the length of time required for an applicant in train service, either for a motorman or conductor, was only about three weeks. His application was taken, he was examined physically, he was put in the shops to learn something about the construction of the car and its management, and he was given about two weeks after that, or three weeks as the case might be, in the nature of studentship upon the car, and then, when he was certified as being competent by one or three, as the rule happened to be upon different roads, as to his fitness to take charge of the car, he was employed.

It was found that the men in that branch of the service, Mr. McClure said, were paid from 18 cents to 25 cents an hour. In the aggregate the men would make from \$68 to \$70 a month, probably as high as \$75. The commission came to the conclusion that the length of time in train service to enable these men to be put in charge of interurban cars was not sufficient, and recommended that they should have at least one year's train service, either upon side lines, upon work trains or in some service before they were given charge of a car.

It required a longer time than one year, under the rules, to obtain a position of similar character on steam lines, and Mr.

McClure was inclined to think that the same standard ought not to be applied to the employment of interurban operatives as on steam railroads. Their service was not of such a complex nature, the trains were not so heavy and the mechanism of the cars was not so complex as the steam cars.

Another thing the commission ascertained was that the manner of blocking interurban roads was yet in embryo, so to speak. There was no automatic block, so far as the Indiana commission was aware, that was approved and in an acceptable condition for successful operation on interurban lines. It was true that steam roads have automatic block systems that are satisfactory, but the same kind could not be applied to electric interurban service and steam lines.

Mr. McClure added that there ought to be a little more flexibility in the wording as to the recommendation for block systems and as to the period of train service that shall be the standard of employment by the companies or the men operating the interurban cars.

George W. Dickinson, Michigan Railroad Commission, said he realized that in Michigan there was a great necessity for some power by the commission or some Federal authority to compel both steam and electric lines to put in use the block-signal system. He did not think the same rule would apply to the operation of electric roads as to the steam roads. It had been stated that in a good many cases the trainmen of electric roads were insufficiently trained and to his personal knowledge they had been put in charge of a car within 15 days after they left their previous occupation. He believed there should be some restrictions and that the report should require the electric railroads as well as the steam railroad companies to supply some block-signal system. In Michigan the electric lines had been asked to block their curves, especially when the view was obstructed, and they were working on that plan to-day.

Mr. McClure moved that the recommendation with reference to block signals on interurban roads, and the standard of previous employment before the employee is given charge of trains either as motorman or conductor, be amended by substitution of the following: "By recommending the enactment of a law requiring interurban electric roads to be adequately blocked and that greater train service be required as the standard of employment thereon than now exists." He also added, in accordance with a suggestion by Mr. Lawrence: "And that power be given to the Interstate Commerce Commission to require the use of a uniform code of signals on all interstate railroads throughout the United States."

With these amendments the report was adopted.

RAILROAD TAXES AND VALUATION

J. C. Lawrence, Railroad Commission of Washington, presented the report of the committee on railroad taxes and plans for ascertaining the fair value of railroad property. An abstract of the report follows:

"In 29 States the railways are taxed on a property valuation only; in five States on property value and specific taxes; in four States on gross receipts; in three States on property value and gross receipts; in two States on capital stock and gross receipts. In the remaining States various other methods are used. It will be seen at a glance that the question of property value is of the greatest importance. There is some difference of opinion as to whether the valuation of railroad property for assessment purposes and for rate-making purposes is the same. Without entering into a discussion, we will assume that a valuation of railway property for rate-making affords a basis of valuation for taxation purposes.

"In any fair method of determining the value of railroad property, such determination should be made with notice to the company whose property is to be valued. Whether such valuation is made under the provisions of a statute directing the course of procedure or not, common fairness and the value of the results to be obtained demand that the valuation be made with notice to the company and that it be given an opportunity to be heard and a full and impartial consideration be given to the testimony submitted by it.

"Conversely it is true that a railroad company whose property

is to be valued by a railroad commission should give such commission and authorized representatives full access to its records for the purpose of securing information and verifying all statements made.

"The most important facts on which to base a determination of the value of a railroad property are: First, the actual cost of construction; second, cost of reproduction, new; third, the depreciated value; fourth, the amount and market value of stock and bonds issued, with a full financial history of the road; fifth, the density of population and traffic; sixth, the nature and permanence of population and traffic; seventh, the facilities for doing business; eighth, physical characteristics; ninth, the amount of earnings and operating expenses.

"All of the facts named are pertinent to the inquiry as to the market value of the property, but none is controlling. A given railroad property may be actually worth only half as much as it originally cost, the cost of reproduction or depreciated value, or it may be worth double the amount in either case. The amount and value of stocks and bonds may have only a remote bearing on the question of real value, according to the reflection of true value in such market value. The density of population and traffic are only indications of probable amount of business to be transacted, not necessarily the earning capacity of the road, except when done at a remunerative rate. The nature and permanence of population and traffic are factors affecting the earning capacity of the road in the future. A road may have ample facilities for doing business without business offering commensurate with such facilities. The physical characteristics are of more vital importance when in the presence of a competing carrier which is operating under more favorable conditions. It is, therefore, apparent that the elements named and other elements which may appear during the progress of the inquiry are only important steps leading to a conclusion which may be summed up in answer to the question: 'What is the ability of the company now and in the future to earn money as a going concern at a charge of reasonable rates?' The considerations which would govern a prudent business man in the purchase of the property, or the owners in fixing a selling price, are the same considerations that should govern a railroad commission in determining the market value of a railroad property.

"The construction records are the best source of information as to construction quantities on which to base a determination of cost of reproduction. While surveys in the field might give information on which to approximate such quantities, such surveys, for this purpose, are open to two principal objections. The first is the cost of doing the work, and the second is inaccuracy of results. In a field survey it is difficult to determine the original ground line, hence impossible to determine grading quantities with any degree of accuracy. It is difficult to determine the amount of work encountered in the construction of bridge piers and abutments and other classes of difficult and expensive construction of which nothing remains visible. Without the actual records of construction accurate quantities can never be ascertained. The term 'original cost of construction' should be applied to the complete cost of the company up to the date of valuation. The term 'actual cost,' as we use it, is synonymous with original cost, but we think it less likely to be misleading.

"The cost of reproduction, new, means determining all construction cost as of a given, recent date. It is found by multiplying the construction quantities, as secured in construction records, by the prevailing unit prices of material and labor. To this amount should be added engineering, superintendence, legal and general expenses, interest during construction, discounts and contingencies, with an allowance for sufficient stores and capital on hand for operation. The cost of reproduction of right-of-way and terminals should be determined in exactly the same way that careful and prudent business men would estimate the cost of producing such right-of-way and terminals in the construction of a new line. The cost of reproduction of right-of-way and terminals cannot be worked out by rule, but will vary according to the conditions met in each locality. It

is the most uncertain and variable element in estimating the cost of reproduction. It is dependent not so much on the price of adjacent property as on the conditions encountered. The market value of adjacent property can be determined within reasonable bounds of accuracy, but the multiple to be used is a question of the judgment of men familiar with the work of obtaining right-of-way and terminals for railroad purposes and the correctness of the result depends on the accuracy of judgment used. The increased value should be allowed in determining the cost of reproduction, new, if the elements entering into the cost of production have increased over original construction to exactly the same extent as would be done in lowering values could the property be reproduced new at less than the original cost. Not only is the railroad company entitled to the unearned increment to the same extent as other property owners, but a failure to allow for such increment would be an injustice to a new, competing line and would discourage competitive building. This is illustrated where a new company, in a given locality, say, in a large city, would have to pay for necessary terminals several million dollars more than an older line with a similar amount of property, it being generally true to-day that the cost of securing right-of-way and terminals has greatly increased over former years.

"The depreciated value of the property can be ascertained by the application of what might be termed mortality tables. First determine the average life of each element, then multiply the cost of each by the per cent of years in use to the average life. The time in use can be ascertained by the records of the company. Where elements of the same class are of different values, such as structures, it is a simple matter to calculate the average age of the money invested, which is what is needed to secure a true measure of the amount of depreciation. For instance, if the average life of a wooden structure is 25 years, and one structure costing \$1,000 has been in existence 10 years and another costing \$5,000 has been in existence 20 years, the average age of the two is not 15 years, but is found as follows: $\$1,000 \times 10 \text{ years} = \$10,000$ one year; $\$5,000 \times 20 \text{ years} = \$100,000$ one year; $\$110,000 \div \$6,000$ (total value of structures) gives $18 \frac{1}{3}$ average years in use, or 73 per cent the depreciation on the total cost, or \$4,400 depreciation. In some instances there is a scrap value after the full life in use, such as rails and steel structures. In such cases compensation should be made by allowing a life somewhat in excess of what it actually has in practical use or modifying the annual depreciation.

"The depreciation of the physical property of a railroad affects the determination of the market value according to conditions encountered, the age of the railroad valued and the efficiency for operations found. During the first few years of the life of a railroad there is little demand for renewals due to wearing out of the ties, rails, bridges, structures and equipment. There is a depreciation, it is true, but not to the extent requiring renewals. At the same time there is an appreciation in the value of the roadbed, due to what is termed 'seasoning,' the settling of embankments requiring a filling in to bring up to required grade and width, clearing out and widening cuts, etc., which require an unusual expenditure during the first few years, all of which adds to the value of the roadbed and must be taken into consideration in the valuation.

"At the end of the average life of a tie there will be a large percentage of renewals. At the end of the second period of such life a large percentage of such renewals will be again renewed. Some ties will be replaced before the average of period and some will last much longer. It is evident that in course of time the number of tie renewals from year to year on the same standard of efficiency will vary but little. This is equally true of rails, bridges, structures and equipment, with a different average life of each. To meet the extraordinary demand for renewals at the expiration of the average life of the elements referred to in the early history of a road good business prudence requires the setting aside of a depreciation fund. This fund is needed to equalize the cost of maintenance during the period extending from the beginning of

operation until the lapse of that period of time which will bring about an average of renewals from year to year when maintenance will take care of the renewals. When such time is reached the requirement of a depreciation fund will cease.

"Prior to this time the existence of a depreciation fund becomes a consideration in finding the value of the property. Take, for instance, two roads of short mileage, with a number of miles of pile trestle and some expensive wooden bridges, all of which have reached a period where renewals are necessary. One road has made no provisions for the cost of such renewals, while the other has set aside a depreciation fund from year to year. Such depreciation fund amounts to the cost of renewals and is equal in value to a road with such renewals made and is clearly of more value than the road which has set aside no depreciation fund and must meet the requirements of such renewals by an increase in rates. Such increased rates put a burden on future traffic that should have been borne in part by the traffic of the past.

"Having a physical valuation of the property, the next step is to determine the market value. While the physical value is a basis for such determination, it by no means fixes the market value. A road originally costing \$5,000,000 may have been built principally for the transportation of forest products. Suppose the forests tributary to it have been exhausted, no other traffic has developed and the road has ceased to pay operating expenses, would the original cost determine its value? Would the cost of reproduction, new, or the depreciated value govern in such cases? Clearly not. No rule for determination of market value can be laid down. Fixed charges must be met, so a knowledge of outstanding issue of bonds and other obligations is necessary. A careful study should be made of the financial history of a road, its stock issue and all sources from which funds were secured for construction purposes.

"The density of population and traffic is one of the greatest importance, coupled with permanency of population and traffic. Other things being equal, the facilities for doing business become an important factor. A road which has a long-established transportation business, with industries located on its tracks, warehouses, both public and private, to facilitate the movement of business, is of greater value than a new road lacking such facilities.

"The physical conditions under which a road is operated largely govern the cost of conducting transportation and directly affect the earning power of a road.

"Having the factors going to show the ability of the carrier to conduct business, with the amount and kind of business offering, a study of the earnings and operating expenses will show the ability of the company to earn money as a going concern. No better evidence can be secured in this regard than the actual earnings and operating expenses.

"From a consideration of all of these and other facts appealing to a commission, the market value of the railroad property will be determined. The determination of *market* value as a basis for rate making solves impossible problems presented in the mere *physical* value as measured in the cost of reproduction."

On motion, the report was received and printed.

POWERS, DUTIES AND WORK OF STATE COMMISSIONS

The report of the committee on powers, duties and work of State railway commissions, prepared by B. H. Meyer, of Wisconsin, who was unable to be present, was read by Clyde B. Aitchison. It was in part as follows:

"We can do nothing more profitable than to enunciate a few generalities relating to the inner organization of State commissions. While we are not advised with respect to the organization of all of the State commissions, sufficient information is before us to suggest that in many instances the character and dignity of the work of State commissions could be greatly enhanced through a change in their respective organizations.

"It should be too late in the day to advocate the proposition that every commission should be organized on the basis of merit. Unless we have been misinformed regarding types of

organization still extant, there is much need for placing emphasis upon this simple elementary proposition. Whatever public money State commissions expend cannot be economically and efficiently spent unless every dollar thus expended is made to secure the very best service available at the time under the prevailing circumstances. Economy and efficiency in the administration of the office are obviously impossible under any system of political patronage. We recall an instance where a member of a State commission had recommended to him for employment an expert to do the particular work in which his commission was interested, but whom he was not permitted to employ, on the ground that the expert did not belong to the dominant political party. This commissioner complained that in his office everybody from the janitor up was obliged to be a member of the party in control and that no appointment could be made from outside the ranks.

"Entirely aside from other considerations, the assertion may be ventured that no political party embraces within its membership a monopoly of talent in any one particular line of endeavor, and proper selection of employees in any department of railway commissions cannot be made if party or any other similar arbitrary lines have to be adhered to. The Constitution has long forbidden the imposition of a religious test for public office, and for the efficient work of State commissions the imposition of political tests is as obnoxious as the imposition of a religious test. More than this, not only should commissions not be limited to special party affiliations in the selection of their staff, but they should be permitted freely to go outside of the borders of their respective States in order to get the kind of help they need if they cannot secure sufficient satisfactory assistance in their respective States. A commission should feel free to go wherever it pleases to employ its help, with the sole aim of getting the most competent force for the money which it can expend.

"The work of State commissions, irrespective of technical differences in the wording of statutes, should develop more and more along investigative lines. Every problem before a commission should be regarded as a problem for investigation and analysis. Every conclusion of a State commission should rest upon an analysis of the actual facts, and an analysis as thorough as it is possible to make. Conclusions which rest upon such an analysis of facts must prevail in the long run, irrespective of the particular direction in which they act. It should be beneath the dignity of every State commission to balance its decisions in such a manner as to maintain an equilibrium between adverse and favorable decisions in the same manner that boys agree upon their bargains with marbles. A commission must travel fearlessly with truth, and not with votes. We have heard it said that years ago a certain commission traveled with truth as long as truth and votes traveled in the same direction, but that when the two parted company the commission traveled with votes. In the long run votes will doubtless go with truth, and every action of a commission which caters to political feeling, prejudice or expediency taints the path of truth. If commissions will take care of their work the ballot will protect this work."

The report was adopted.

ADDRESS OF MARTIN A. KNAPP

Martin A. Knapp, chairman of the Interstate Commerce Commission, made an address of welcome in which he said:

"It is easy to see that great progress has been made in the task which has been committed to our hands, and I have this encouragement, that when I contrast the methods and practices which were characteristic, if not universal, a score of years ago with the methods and practices which generally obtain to-day I can see an immense advance toward upright conduct and impartial treatment of the public. Quite as significant as this, to my mind, is the altered attitude of railroad managers toward the whole subject of public regulation; that, whereas it was then opposed, belittled, obstructed, it is to-day, if I may not say welcomed, at least conceded to be a public necessity.

"But I am not altogether persuaded that the scheme of public regulation has passed the experimental stage. I do not forget

that older countries than this, whose experience we may well consider, have, with only one notable exception, adopted the other theory and made their transportation lines a government service, and I am more and more impressed with the belief that upon the wisdom of our Legislature, the prudence and intelligence of its administration, depends in great measure, if not altogether, whether that experiment is to be permanently successful or whether the other and more undesirable result will be reached at no remote date.

"I realize in some degree the difficult and delicate questions which have arisen and must arise between State and federal authorities, and I can see in that direction the possibility of such disappointing and unsatisfactory results as, instead of promoting popular confidence in railway regulation, will furnish an impetus toward a movement in favor of the nationalization of our railway systems. That to me is a constant admonition that we should seek that substantial harmony of legislative measures and that substantial co-operation in our administrative policies that will result not only in the wise and useful regulation of our railway systems, but strengthen and confirm that policy as against government ownership."

ADDRESS OF PRESIDENT DECKER

Martin S. Decker, of the New York Public Service Commission for the Second District, read his address as president. He said in part:

"I think many of us have come to realize that through this association much of the necessary planning or groundwork of regulation may be successfully accomplished. We have about reached the time, I think, when investigations of related railway rates may properly include conferences between regulating commissions before determination. State commissions deal with a State commerce that in many important aspects is related to interstate commerce, and in another sense is related to the internal commerce of adjacent States. What is said of rates applies as well to rules or regulations affecting rates.

"We know that under the Constitution of the United States, as it has been definitely interpreted by the Supreme Court of the United States, each State has exclusive jurisdiction of transportation conducted wholly within its borders, and the United States has exclusive jurisdiction of transportation which passes across State lines, and each of these jurisdictions applies in full to the agencies engaged in such transportation. As to all matters where the jurisdictions are severable the fundamental law is well settled. We need not waste our time, therefore, in consideration of practical difficulties arising from the exercise of authority in these separate jurisdictions. It is for us rather to deal with the work of avoiding practical difficulties through an effort to apply regulation by national and State authority along harmonious lines, accepting and enduring situations which temporarily may not be cured, but trying through conferences and co-operation to bring about rates and rate rules based upon right and justice to all concerned.

"It is plain that the association through its committees may work actively toward securing harmonious action in large territories, and possibly the whole country, as to matters of general concern—harmony in those respects between the States as well as between the State and the United States. Much has been done along that line, now and then under separate State or federal action something may be undone, but differences of view may be reconciled and many things that remain to be accomplished may be constantly progressed under the larger comprehension and broader outlook resulting either from special conferences between particular commissions or as the result of the work of committees acting under the authority of this association.

"I recommend this association to take a far more active part than it has done in the past in securing greater uniformity of regulating laws in the various States. Perhaps the committee on legislation might be instructed to co-operate to that end with the commissions on uniform State laws and otherwise so far as may be practicable.

"The work of the regulating commissions is in nature and scope distinctly opposed to legislative prescription of rates.

Wherever a commission has been established to pass upon the reasonableness and justice of the rates of any public-service corporation the passage of acts by the Legislature prescribing schedules of maximum charges constitutes to that extent a substituted regulation and thereby diminishes not only the authority, but the general usefulness of that commission. The delegation of powers by the law-making body to a railway commission is justified and has been judicially upheld, because rate regulations and other specific matters of transportation can be rightly determined only upon thorough investigation, such as cannot be made by the legislative branch of the State or Federal Government. We are now fully committed to the scheme of regulating public-service corporations by commissions because only that method of regulation has been found to operate successfully.

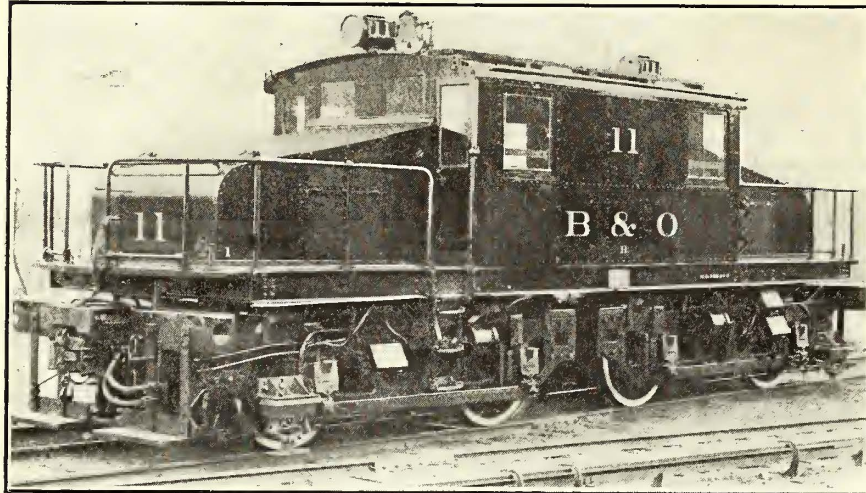
"The great and broad powers which have been conferred upon the Interstate Commerce Commission and upon many State commissions, the almost yearly additions to the number of these strong commissions, the general recognition that public-service corporations are best guided in their relations with the public by a competent administrative body in each State and for the nation demonstrate the final determination of the people that these great public-service companies shall be intelligently regulated under patient investigation and impartial action by independent tribunals of this character. It is of course a matter of high public concern that these various regulating commissions and those who constitute their membership shall be free from the trammels of political influences in the same way and to the same extent as our courts and judges are under the force of tradition and general public demand. The great insistent people, who have finally succeeded in establishing efficient systems of regulations for public-service corporations based upon protection of the right of citizenship and industry and fairness to the owners and managers of such corporations, plainly are vitally concerned that these regulating systems shall be continuously administered solely in the public interest.

"Commissions established to regulate carriers and other public utilities take valid action only when they predicate their determinations upon standards necessarily fixed by the legislative body and under procedure by which all material facts and conditions shall be developed. So that end may be fully attained the commissions are left usually to fix the character of their proceedings and investigations. They work without the trammels of court practice or of court rules as to admission of evidence, but they may not on the other hand undertake new legislation. Their functions are quasi-legislative, quasi-judicial, and in some sense executive. These the courts have held to be neither purely legislative, judicial nor executive, and have summed them up in one word as administrative. As such administrative tribunals the important work of these commissions affects directly and indirectly all phases of industry and transportation. Not merely the instrumentalities of commerce but commerce itself is regulated by the commissions. Indeed it may be said that the great purpose of regulating carriers is to liberate our vast and increasing commerce from the burdens, prejudices and disadvantages, the preferences, discriminations and oppressions which in myriad forms and countless definitions have been and are continually presented under the changing conditions of trade, industry, and communication, the growth and distribution of our population, and the ever-increasing needs of civilization.

"Yesterday, so to speak, the rebate and free pass became as rare as counterfeiting or train robbery. To-day, while the carriers assert the need of higher rates to meet increased cost of operation, the putting of high rates in force is cheerfully withheld by the carriers pending authoritative inquiry into the propriety of such rate advances. Who can say that to-morrow we shall not put in practice through governmental supervision and co-operation, sought by the carriers themselves and fully sanctioned by the force of public sentiment, methods of rate construction under which many of the great problems that now perplex us will almost magically disappear?"

NEW ELECTRIC LOCOMOTIVES FOR THE BALTIMORE & OHIO RAILROAD

During the present year the service on the Baltimore belt line of the Baltimore & Ohio Railroad has required the addition of the two electric locomotives which are illustrated and described in this article. The locomotives were designed and equipped by the General Electric Company, the mechanical portion being furnished by the American Locomotive Company. The complete locomotive as shown in Fig. 1 is similar to that



Baltimore & Ohio Locomotive—Fig. 1, Front and Side View of the Latest Design for Baltimore Belt Line Service

built for the Detroit River Tunnel Company, but differs from it in details and is the first of this type to be used on the Baltimore & Ohio. The cab resembles the type which has been widely used for switching locomotives on interurban electric railways, while the trucks and running gear are suitable for the severe duty demanded in trunk line service.

The running gear is articulated and consists of two four-wheeled trucks connected through a massive hinge which allows the two trucks to support and guide one another without interfering with the lateral flexibility required in curving with a long wheel base. The framing is massive and the sections are heavier than actually required for mechanical strength on account of the necessity of obtaining ample weight for tractive effort. The side frames are steel castings 5 in. thick, bolted together through steel end frames and bolster castings of a box girder pattern. Draft gear and buffers are carried on the outer end frames. The wheels are steel tired, 50 in. in diameter, with the motor gears mounted directly on extensions of the wheel hubs. The journal boxes are of cast steel and are carried in pedestal jaws between shoes 9 in. wide and have journal bearings $7\frac{1}{2}$ in. x 14 in. The weight of the locomotive is carried on the boxes through semi-elliptic journal box springs equalized together to obtain the most uniform possible distribution of weight over groups of springs. This construction concentrates the principal hauling and buffing strains in the trucks themselves and relieves the platform and cab of all stresses except those due to its own weight and that of the control and operating apparatus mounted on it.

The cab platform is 38 ft. 6 in. in overall length. It is carried upon side bearings on the two trucks, and upon two center pins, one of which has a slight longitudinal sliding motion in order to accommodate the variation in center pin distance due to curving.

The platform is built up of 10-in. longitudinal sills 34 ft. 1 in. in length and riveted to 10-in. end sills. The body bolsters are built up of 1-in. x 12-in. plates to which are riveted the center pin castings referred to above. A cover plate below the two center sills forms, with the floor above, an enclosed air space which serves for distributing air from the blower located in the center of the main cab for forced ventilation of the motors. The whole platform is braced and squared by heavy floor plates

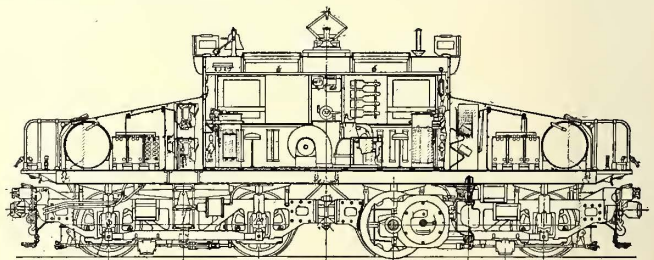
extending the whole width of the platform and riveted to side sills and end sills.

The cab consists of a main operating cab located in the center of the platform and sloping auxiliary end cabs extending toward the ends of the locomotive. A series of interior illustrations are presented to show the study that has been expended on the location and arrangement of apparatus and wiring.

Fig. 2 shows the arrangement of the principal pieces of apparatus as arranged for the Detroit locomotive and followed for the Baltimore machines. The auxiliary cabs are 6 ft. in width and contain parts of the apparatus which are not subject to inspection and repairs. In the outer end of this cab are located the main air reservoir and sand boxes for sanding the leading wheels. The rheostats come next on the floor of the cab. Perforated side sheets allow a circulation of air through and around these rheostats for ventilation. The upper part of these side sheets is hinged and held with spring locked buttons to permit the convenient inspection of rheostats and wiring. The end cab is held to the platform and main cab by means of bolts, but for major repairs these can be removed and the end cab completely removed from the locomotive to give access to all the apparatus contained in it.

The contactors are located in the auxiliary cab, but stand in a bank facing the main cab. Fig. 3 is a view of this bank of contactors taken from the floor of the main cab. During operation these contactors are inclosed by asbestos-lined folding doors which shut them off from the main operating cab, as shown in several of the succeeding views. The space on either side of the auxiliary cab is devoted to a platform running from the main cab to the ends of the locomotive, permitting, on one side, access from the main cab to the coupler, and, upon the other side, affording an uninterrupted view for the operating engineer.

Turning now to the main operating cab, it will be noted from the views of the interior that all wiring is in conduit. Even the bell and whistle ropes are drawn through pipes, both for protection and for conformity in appearance with the rest of the piping and wiring. The central piece of apparatus in the cab is the air compressor. This is a CP-26 compound compressor, motor-driven, with a capacity of 100 cu. ft. piston displacement per minute when pumping against 130 lb. reservoir pressure. The center of the main cab is the most feasible point for locating the compressor as it permits the various items which may require attention, such as valves, piston rings, brushes, etc., to be accessible from every side. Figs. 4 and 5 show the com-



Baltimore & Ohio Locomotive—Fig. 2, Layout of Apparatus on Detroit River and Baltimore Tunnel Locomotives

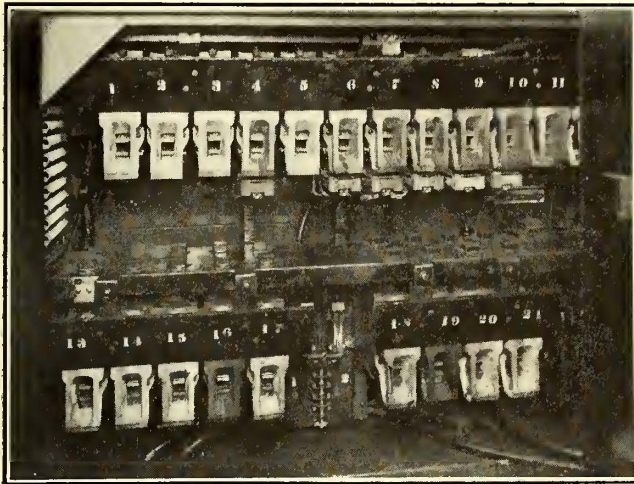
pressor and piping leading to it. In passing from the low pressure to the high pressure cylinder, the air is carried by a 2-in. pipe to the roof of the cab and through about 35 ft. of pipe lying on the roof in order to provide the radiating surface necessary to reduce the temperature of the air before entering the high pressure cylinders. A similar length of radiating pipe is inserted between the high pressure cylinder and the main reservoir for the same purpose. The compressor is controlled by an

electro-pneumatic governor mounted on the A side of the cab, shown in Fig. 4, and arranged for maintaining the reservoir pressure between the limits of 120 lb. and 130 lb.

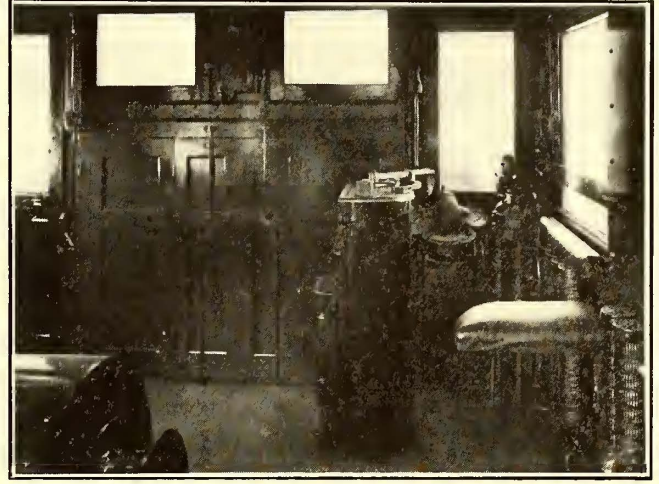
A fan for forced ventilation of motors is placed beside the compressor. This fan delivers air into the enclosed space or distributing chambers previously described. The air from this distributing chamber is carried through branch pipes to the motor. Against the side walls of the cab as shown in Figs. 4 and 5 are mounted racks for paddles and flags, and electric coil

preprehensive as if he were at the extreme front end of the locomotive.

The motor equipment consists of four GE-209 motors. Each motor is furnished with twin gearing, a pinion being mounted on each end of the armature shaft and a corresponding gear on each driving wheel. With absolute alignment of the armature shaft and axle insured, the strains on the gear teeth are reduced to a minimum. The motor is a 600-volt commutating type. The equipment of four motors can exert a tractive effort of 46,000



Baltimore & Ohio Locomotive—Fig. 3, Bank of Contactors Opening on Main Cab



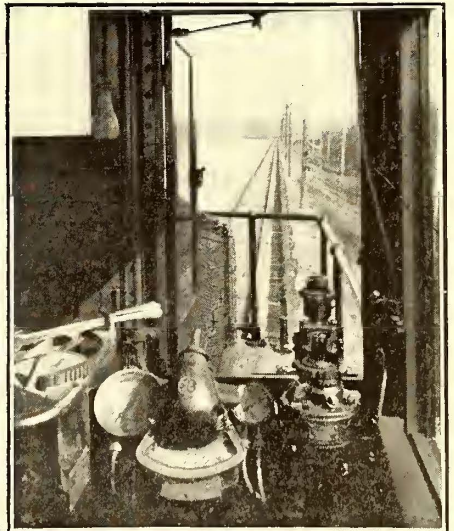
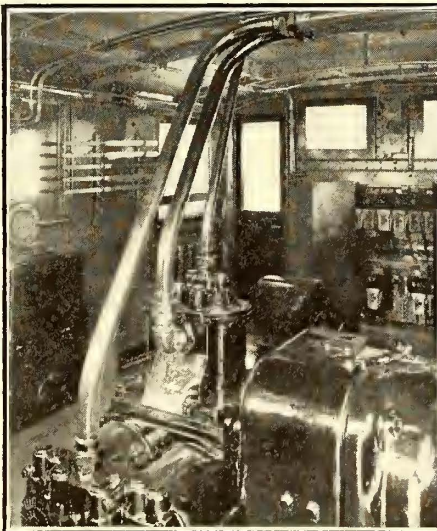
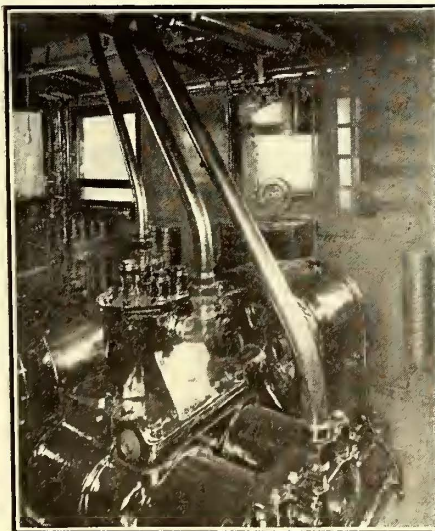
Baltimore & Ohio Locomotive—Fig. 7, Motorman's Corner Alongside Contactor Cabinet

heaters for heating in the cab. Sand boxes for sanding the track in front of the rear truck are also placed in the middle of the side walls. They are operated from the engineer's position simultaneously with the forward sand boxes in the auxiliary cabs.

Figs. 6 and 7 show the apparatus for direct control of the locomotive, located at the engineer's window. This is in duplicate at the two opposite ends of the cab, and consists of the master controller, air brake valves, air gages and ammeters. The handles for bell and whistle ropes, the switches for headlights and valves for sanders are also within convenient reach.

lb. at 14 m.p.h., which is the theoretical slipping point of the wheels, assuming a co-efficient of adhesion of 25 per cent.

To obtain some idea of the power of these locomotives, they may be compared with the heaviest types of steam passenger locomotives. The Baltimore & Ohio electric locomotives weigh 90 tons on drivers. The weight on the drivers of the Pacific type of steam locomotives, which is the type used for heavy passenger service, very rarely exceeds 75 tons. A weight of 90 tons to 100 tons on drivers is obtained only on freight locomotives of the Consolidation and Mikado types. The weight on drivers, which determines the maximum pulling power of the



Baltimore & Ohio Locomotive—Figs. 4, 5 and 6, Main Cab Arrangement

Fig. 6 shows the arrangement of this apparatus in detail and also illustrates the uninterrupted view of track and right-of-way which is obtainable from the operator's seat.

One of the great advantages of this sloping cab and open side platform design is that the engineer's window is about 12 ft. back from the front end of the locomotive. This arrangement affords protection in case of collision and buffing accidents, while giving the engineer a view which is practically as com-

prehensive as if he were at the extreme front end of the locomotive.

In the steam locomotive, however, on account of boiler limitations, it is impossible to carry the maximum tractive effort at speeds higher than 8 m.p.h. or 10 m.p.h., while the electric locomotive will develop its maximum tractive effort at 14 m.p.h. This tractive effort of 46,000 lb. at 14 m.p.h. corresponds to an output of 1700 hp. The electric locomotive, however, is more

flexible and has a greater power than indicated by these figures. By means of the multiple unit control, which is a feature of these locomotives, two of these 90-ton units can be coupled together and operated by one engineer in the forward cab. All the motors are controlled simultaneously by one operating handle, and one engineer thus has under his control a maximum capacity of 3400 hp or a maximum tractive effort of 90,000 lb. developed from one 180-ton locomotive.

It might be noted that 180 tons represent approximately the weight of a single large steam locomotive and its tender, and that in the steam locomotive only half this weight is on drivers, while in the electric type the whole 180 tons is on drivers and is capable of being applied for developing tractive effort. With a light passenger train, a single 90-ton electric locomotive will develop speeds of 25 m.p.h. to 35 m.p.h. on the level. The new locomotive is therefore an engine capable of handling the heaviest freight trains over the tunnel grades or the highest speed passenger trains at the greatest speed consistent with its tunnel service.

The following table gives the principal dimensions of the new locomotive:

Number of motors.....	4
Gear ratio	3.25
Number of driving wheels.....	8
Diameter of driving wheels.....	50 in.
Total wheelbase.....	27 ft. 6 in.
Rigid wheelbase.....	9 ft. 6 in.
Length inside knuckle.....	39 ft. 6 in.
Length of main cab.....	15 ft. 6 in.
Length of cab overall.....	33 ft. 6 in.
Total weight	184,000 lb.
Tractive effort at 25 per cent coefficient.....	46,000 lb.
Speed at maximum tractive effort.....	14 m.p.h.

HEARING ON INTERCHANGE OF CARS IN MASSACHUSETTS

The Massachusetts Railroad Commission gave a hearing on Nov. 4 upon Resolve 138, Acts of 1910, requiring the board to investigate and report to the Legislature of 1911 upon the advisability of requiring street railways to interchange cars.

Joseph B. Eastman, for the Public Franchise League of Boston, appeared in favor of the measure, and urged that the board report a bill conferring upon itself the power to order or recommend the interchange of cars in its discretion. W. M. Butler, president of the Boston & Worcester Street Railway, notified the board that he is opposed to the measure. George C. Travis, counsel for the Boston Elevated Railway, offered to file a brief with the commission within 10 days stating objections to the proposition.

At a legislative hearing held on this subject during the past session C. S. Sergeant, vice-president of the Boston Elevated Railway, opposed the plan of compulsory interchange, stating that there are many physical obstacles to safe operation on such a basis, that the differences in line voltage and equipment design on various roads might be serious to a comprehensive working out of such a plan, and that the clearances of large cars would be prohibitive in many cases, while different standards of wheel width and tread were also objectionable points.

The hearing was continued so as to permit further arguments to be filed.

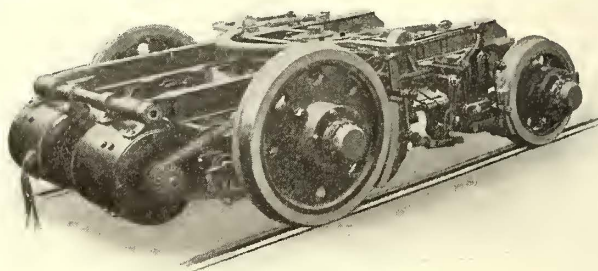
MEETING OF CENTRAL ELECTRIC TRAFFIC ASSOCIATION

The regular monthly meeting of the Central Electric Traffic Association was held in the office of the chairman of the association at Indianapolis, Ind., on Nov. 14, 15, 16 and 17, 1910. The sessions were devoted largely to checking and revising Joint Passenger Tariff No. 3 and the proposed uniform exception sheet. Owing to the numerous changes in the rates and routes in the passenger tariff, it was decided to continue the work at the meeting which will be held in the office of the chairman on Dec. 12, 13 and 14. Four additional companies signified their intention to adopt the revised tariff.

DOUBLE-TRUCK STORAGE BATTERY CAR

The Federal Storage Battery Car Company, New York, has recently completed a double-truck accumulator car, with which a number of demonstration runs have already been made on the Watchung branch of the Erie Railroad in New Jersey. Further demonstrations are to be made with this car on the Lackawanna Railroad, and afterward the same car will be operated in New York over the Queensboro Bridge by the South Shore Traction Company.

As shown in the illustrations on page 1069, this car is of the vestibule type, with maximum traction trucks. The storage battery equipment consists of 190 A-8 Edison cells. The car body is 28 ft. long inside of the corner posts and 7 ft. 6 in. wide over the drip rail. It is furnished with longitudinal rattan seats for 40 passengers. Both the longitudinal and end risers of the seats consist of perforated metal screens. There are two platforms, each 6 ft. 1½ in. long. The usual body end doors are omitted, but each vestibule is provided on the right with a sliding door and on the left with two double-leaf folding doors. The arrangement of these doors is such that the sliding door is always the exit on the motorman's platform and the double folding door the entrance on the conductor's platform. The folding doors are controlled by the conductor through the Remelius lever system, as used on many cars of the Public Service Railway of New Jersey. These platform and door arrangements permit the use of either the prepayment or ordinary methods of fare collection.



Two-Motor Chain Drive on Truck for Storage Battery Car

The window posts are provided with electric bell connections to enable the passengers to signal the conductor. The motorman's curtain is carried from the ceiling of each vestibule.

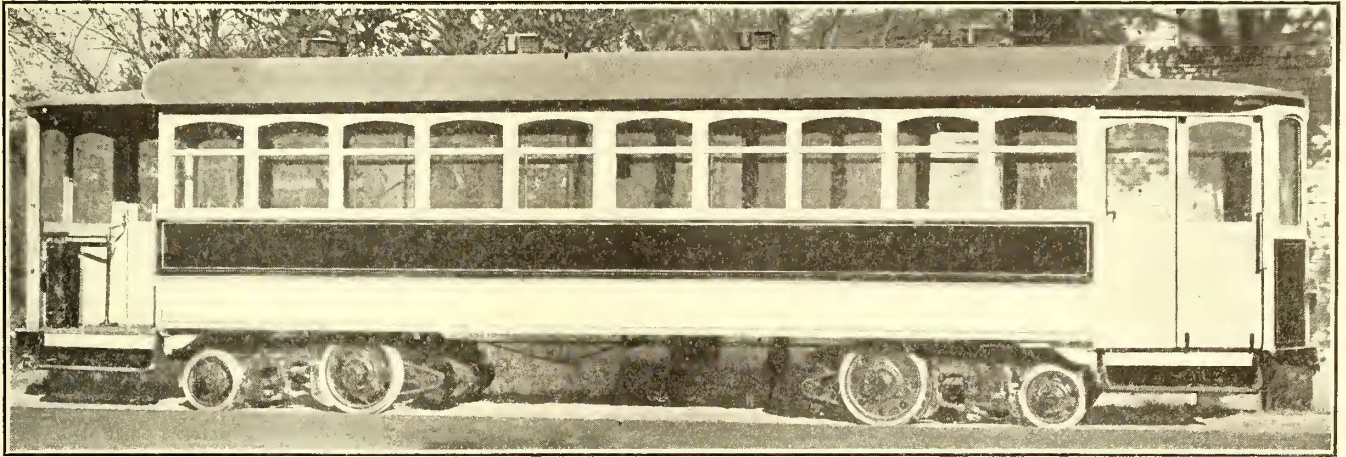
Instead of straps there are provided eight 1¼-in. vertical and two longitudinal tubular steel stanchions. These tubes act as grab rails, as supports for the lighting fixtures, as conduits for the lighting cables, as interior supports for the roof and as longitudinal supports for the body. The vertical tubes are finished in black and the longitudinal tubes in white porcelain. Each vertical tube has a fixture carrying two 10-cp tungsten lamps. There are 16 lamps for interior lighting, besides two ceiling lamps and a headlight per vestibule. Inasmuch as the wiring is in multiple, any number of lights may be used as desired.

The construction of the car is very novel since the special objects of the designer, Ralph Beach, were to reduce dead weight and to eliminate friction losses as far as possible. The underframing is composed of open-hearth steel shapes with channel side and end sills and I-beam center and cross beams. The bolsters are of cast steel and are so formed as to receive the center sill to which they are welded. The side sills are welded to the ends of the bolsters and the end sills and all cross beams also are welded to the center and side sills. All of this welding was done by the oxy-acetylene process.

The sides are formed of angles and channels, making a lattice to which the outer sheathing of steel plate is electrically welded. This outer sheathing is also carried to the lower edge of the side sills, to which it is electrically welded. Two angles are electrically welded on the outside and one on the inside longitudinally to give the required stiffness to the entire structure. On the inner side of the side structure there is placed a

lattice steel girder extending the full length. This girder is also electrically welded. At each window channel an angle is placed at 45 deg. and is welded to the lattice steel girder and to the side, the longitudinal steel girder and the cross sill, thus binding the structure very firmly. The center window post is formed of a channel bent to conform to the shape of the cross section of the body; it is welded to the side sills, the lattice girder and the 45-deg. angle and is carried in one

trucks. The axles are of chrome steel I-beams, each forged with $3\frac{3}{4}$ -in. ends inserted into the bearings. The latter are of the Railway Roller Bearing Company's roller type and are set in the wheel hubs. The axles do not rotate. The load, as is usual in maximum traction trucks, is carried principally on the driving wheels. The latter are 30 in. diameter and the ponies of 22 in. diameter. The wheels have steel centers and rolled rims. Each driving wheel is driven through a Morse



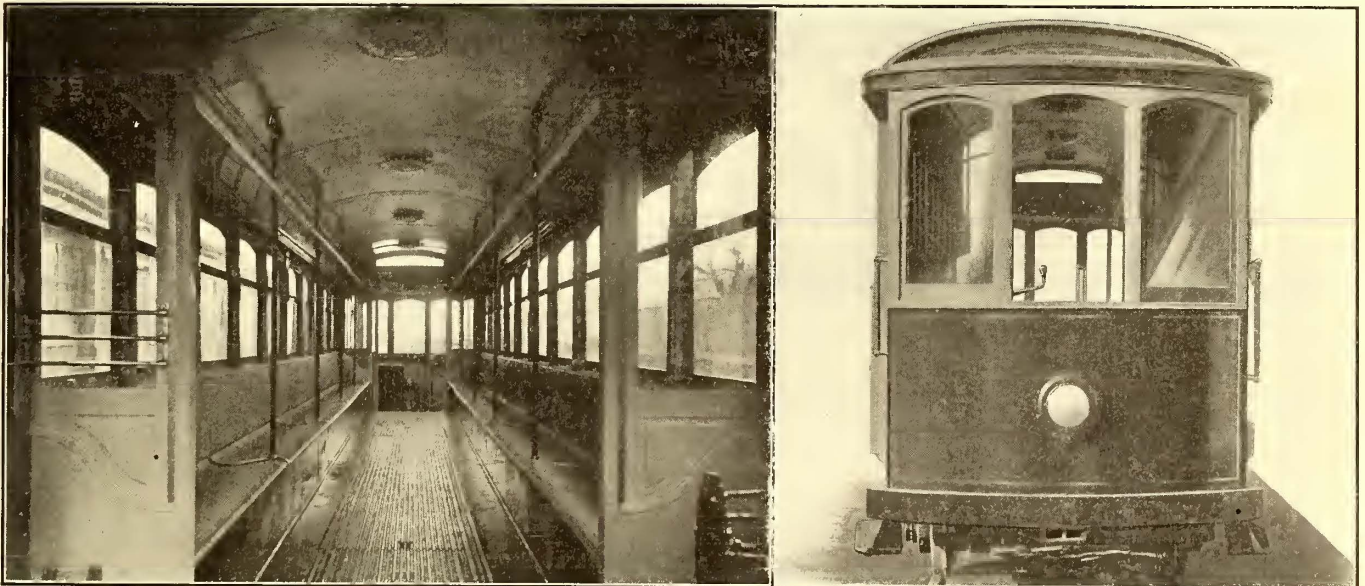
Double-Truck Storage Battery Car with Maximum Traction Trucks

piece all the way over the body. Each end bulkhead is made up of the channels which form the corner posts and of properly shaped steel plates. The bulkhead is oxy-acetylene welded to the end sill, the side framing, the side plating and the lattice steel girders. Thus the entire framework is a unit structure without a bolt or rivet.

The body trim is of ash. The design is of the usual appearance, except that the roof is formed of two eccentric arches, the outer arch being of strips of basswood and the inner of composite board. A novel feature of the body is a steel belt just below the line of the roof which is welded to

silent chain by an 85-volt, 30-amp No. 1022 G. E. automobile type motor, equipped with Hess-Bright armature ball bearings. The motor speed at the operating potential of 100 volts is 850 r.p.m. The speed reduction is about $3\frac{1}{2}$:1. Suitable distance rods are provided to take up the chain wear. The members of the truck frame are standard I-beams welded throughout. The wheel base is 4 ft. 10 in. The center bearing of each truck has Symington ball bearings, while the side bearings are of the roller type.

The weight of this double-truck car is 29,000 lb. completely equipped, which gives the low weight of 725 lb. per seated pas-



Interior and End Views of Double-Truck Storage Battery Car

the bulkhead at the four corners and the center steel arch. On each side of the middle of the body inner lugs are welded to this belt to support the window posts. The structure therefore has a one-piece steel underframe, a belt of steel up to the windows, steel ends and a steel belt above the window held at six points. The platform and vestibule are of the usual design of construction.

An entirely new method of design has been followed in the

senger. The maximum speed is given at 30 to 35 m.p.h.; the average power consumption at 650 watt-hours per car mile; and the acceleration on level track at 1 m.p.h. per second.

One of the novel equipment features of the car is the use of a Klaxon electrically operated horn, used so extensively in automobile work. It effects a considerable saving in power over the usual air whistle, while giving out the same volume of sound as the latter.

AUTOMATIC BLOCK SIGNALS ON THE ILLINOIS TRACTION SYSTEM

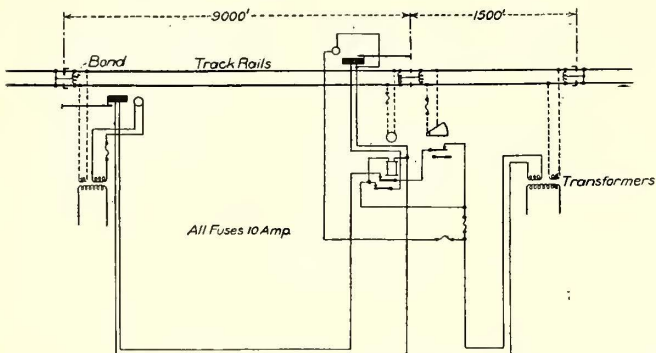
The Illinois Traction System has closed a contract with the Union Switch & Signal Company to install automatic block signals on 100 miles of track. This is said to be the beginning of a program for the protection with automatic block signals of the entire 550 miles of interurban track included in the Illinois Traction System. The first installation will include: Peoria to

from siding to siding will so be arranged that every train will be protected by a signal set at danger both ahead of and behind the train. By the use of the home signals placed at the sidings and distant signals to govern the approach of trains which are to meet at the sidings, the capacity of the track for handling trains will be increased.

The distant signals will be fully automatic. That is to say, if two trains are to meet at a siding and one train should arrive in advance of the other, the second train on approaching the siding will find a distant signal set to indicate caution and the motorman will approach the switch prepared to stop. All switches will be protected with switch circuit controllers so that the misplacement of any switch or the failure to close the switchpoint tightly against the stock rail will set the home and distant signals on both sides to "danger."

Energy for operating the signal system is to be taken from the secondary side of the rotary converter transformers in the substations. This energy will be distributed along the line by a pair of hard-drawn copper wires carrying current at 2300 volts pressure. At the signal locations, transformers will be installed to step down the 2300-volt current to supply 110-volt current for the operation of the signal mechanisms and the semaphore lamps. These transformers also will supply energy at about 12 volts for the track circuits. The low-voltage terminals of the transformers will be connected one to each rail and at each signal location the track rails will be sectionalized with insulated joints. This sectionalization will not interfere with the passage of the propulsion current. The two sections of track on either side of the insulated joints at a signal location will be connected by a pair of reactance bonds. These provide full carrying capacity for the return propulsion current, but offer sufficient reactance to choke the passage of the alternating current used for actuating the track circuit signal relays.

Each track section will be supplied at one end with low-potential alternating current and at the opposite end this current will pass through a track relay. The passage of the current through the track rails is continuous and must be so in order to hold the relay in such a position that the signal which it controls will remain at "clear" provided the track circuit is not interfered with. When a train passes onto a track section, the wheels and axles offer a low resistance path from one track rail to the other and thus short-circuit the secondary of the track transformer. This cuts off the supply of current from the track



Circuit Diagram for Curve Protection

Mackinaw Junction, together with the approaches to that junction from all three directions; 20 miles of track near Staunton and Carlinville and five miles of track leading west from Danville toward Champaign. Signals will be placed at all the more hazardous locations, such as at curves, subways and approaches to double-track sections in addition to the signals at sidings.

The signal apparatus is to be installed immediately, the preliminary work having been completed pending the closing of the contract. Standard steam railway type signals of exactly the same design as are now in use on more than 6000 miles of track of the Southern and Union Pacific Railroads will be used. This is thought to be the first extensive application of full automatic block signal protection to a long-distance single-track interurban road and will no doubt attract considerable attention from operating men. The signals will be controlled and actuated by alternating current taken from the railway transmission system.

The principal circuit diagrams and the arrangement of signals at sidings are shown by the accompanying engravings. The

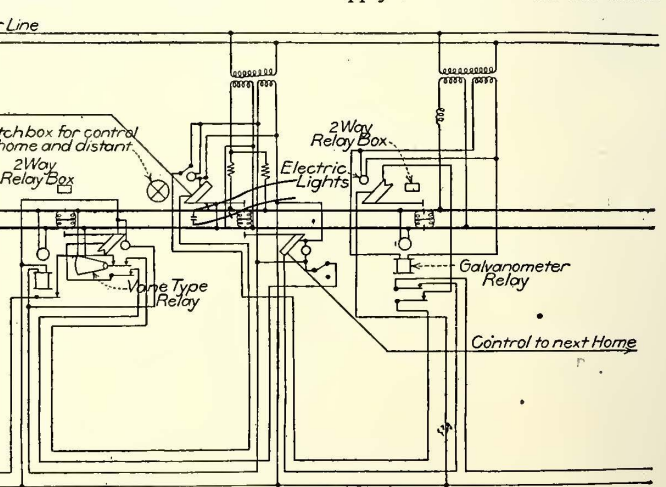


Diagram of Signal Locations and Circuits at Stub-End Sidings

smaller engraving shows the arrangement of signals and circuits for curve protection. In general four signals will be installed at or near each stub end siding. At the siding will be a home signal for each direction and from 1500 ft. to 1800 ft. away, according to running conditions, will be distant signals to control the approach. The signals will be controlled by track circuits so designed that any derangement of the running rails, bonds, signal wires, relays or other control apparatus automatically will cause the semaphore blades to assume the horizontal position by gravity. Similarly, the control of the signals

relay. Then the relay will operate and in turn will release the signal mechanism, allowing the blade to assume the stop position by gravity. After the train has left the section the flow of current in the track circuit again becomes normal and the relay closes, causing the actuating current to pass into the motor which drives the single blade to the clear position.

The new installation of automatic block signal protection on the Illinois Traction System will be supplemented by dispatchers' signals. As announced in last week's issue, a contract has been made with the Baird Electric Company, of Chicago, to

supply selectors which will make it possible to operate the dispatchers' signals at every siding on 100 miles of track. Similarly, about 200 miles of track are being equipped with Blake dispatchers' signals. The automatic block signal apparatus and the dispatchers' signals will not be connected in any way mechanically or electrically and thus two-fold safety of train operation will be obtained.

PROPOSAL FROM HUDSON & MANHATTAN RAILROAD REGARDING OPERATION OF TRI-BOROUGH SUBWAY

William G. McAdoo, president of the Hudson & Manhattan Railroad, New York City, made a formal offer to the Public Service Commission of the First District of New York on Nov. 18, 1910, on behalf of that company to operate the tri-borough subway system, with certain modifications of the Brooklyn connections. As has previously been noted in the ELECTRIC RAILWAY JOURNAL, bids have been received by the commission for the construction of the Broadway-Lexington Avenue, Canal Street and Broadway-Lafayette Avenue lines which are included as part of the triborough system. The estimated cost of the construction of the new lines to the city, according to Mr. McAdoo, would be \$100,000,000, while the cost of tracks, signals, power houses, rolling stock, etc., would be \$50,000,000. Mr. McAdoo proposes that the city provide the money for construction and the Hudson & Manhattan Railroad provide the money for the equipment. His proposition regarding the modification and construction of the system follows:

"(1) That the city proceed forthwith to construct the Broadway-Lexington Avenue line as planned, extending from River Avenue, in the Bronx, to the Battery;

"(2) That the commission immediately lay out the following routes as additions to and extensions of the said Broadway-Lexington Avenue line:

"(a) Beginning at the intersection of Broadway and Thirty-third Street, Borough of Manhattan (there connecting with the extension which this company is to build under Sixth Avenue and Forty-second Street to the Grand Central Station), and continuing southwardly along Broadway to Tenth Street, there connecting with the local tracks of the Broadway-Lexington Avenue line.

"(b) Beginning at a point on the Broadway-Lexington Avenue line in Church Street, between Liberty and Rector streets, and thence under the Trinity churchyard to Wall Street, and thence under Wall Street and the East River, Montague Street, Borough Hall Park, Willoughby Street to Flatbush Avenue extension, there connecting with the new Fourth Avenue subway now under construction, and using the tracks of said subway, including the DeKalb Avenue station, to Fulton Street; thence under Fulton Street to Lafayette Avenue, and under said avenue on the plan already adopted to its intersection with Broadway, in the Borough of Brooklyn.

"(3) That there be constructed under Broadway, between Thirty-third and Tenth Streets, and between Church Street and the intersection of Lafayette Avenue and Broadway, in the Borough of Brooklyn, a double-track subway of the dimensions of the Broadway-Lexington Avenue line, with stations at convenient points. We will build our Grand Central extension of sufficient dimensions so that with a physical connection at Forty-second Street and Lexington Avenue it may be operated as an integral part of the system herein proposed."

If the commission will modify and construct the system as Mr. McAdoo proposed, the Hudson & Manhattan Railroad will agree to furnish the \$50,000,000 necessary to equip the line and will operate the system under a lease for a period of years to be agreed upon on substantially the following terms:

"The net earnings resulting from the operation of said system shall be applied:

"1. To the payment of interest and taxes on said \$50,000,000 or whatever sum is required for the construction of the Grand Central extension and for the equipment of said system, as aforesaid, the money therefor to be provided by this company

and expended under the supervision of the Public Service Commission.

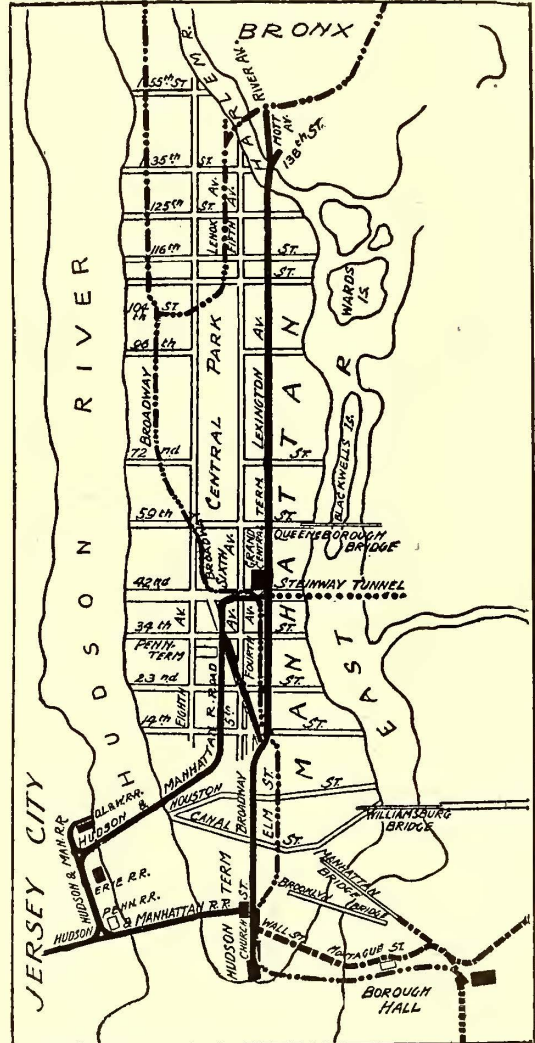
"2. To the payment of interest on the money expended by the city for the construction of said system.

"3. Should the net earnings be insufficient to pay said interest and taxes in full, a special account shall be kept of such deficiency and all surplus earnings thereafter shall be applied to the liquidation of said account until the same shall be paid in full.

"4. Thereafter all surplus earnings remaining after full payment of fixed charges of every kind shall be divided equally between the city and this company.

"5. An amortization fund of 1 per cent per annum shall be established and commence at some time after the beginning of operation of any part of said system, to be agreed upon.

"6. A uniform 5-cent fare shall be charged over said system,



Map Showing (by Solid Lines) the Tri-Borough System in Manhattan and the Present Hudson & Manhattan System. Other Existing or Proposed Lines Are Shown by Dots or Dashes

but not to include carriage over our present Hudson River tunnel system, for which a separate fare will continue to be charged."

Mr. McAdoo says that the conditions which have just been outlined are the fundamentals of the company's proposition and that the details can be arrived at by conference and agreement. In concluding his communication to the commission Mr. McAdoo said that the company is prepared to furnish a bond for \$1,000,000 to insure the faithful performance of any contract that may be entered into between the company and the city, but that "in view of the large financial undertaking which the company would assume in carrying out this plan, it is obvious that we cannot allow the proposition to remain open indefinitely and that promptness is essential."

An interview with Theodore P. Shonts, president of the Interborough Rapid Transit Company, published in the newspapers of Nov. 17, 1910, developed the fact that a difference of opinion exists between Mr. Shonts and Chairman Willcox, of the commission, as to whether the letter of the Interborough Rapid Transit Company to the commission, dated July 5, 1910, contained a definite proposal from the company on the subject of extensions to the subway.

On Nov. 16, 1910, Mr. Willcox replied to the criticisms of the triborough subway route which have been made recently by the Chamber of Commerce, the Merchants' Association and others. He said that years ago the question of a comprehensive system of rapid transit was decided by the Rapid Transit Commission and the Board of Estimate and Apportionment and that this system had been adhered to in the main by successive boards and by the Public Service Commission. In the statement which he issued Mr. Willcox said:

"Cost of construction of the triborough system, including station finish, of the entire system is \$147,500,000. The Centre Street loop, costing \$9,800,000, is nearly finished. The six sections of the Fourth Avenue subway, costing \$15,000,000, will be finished within 18 months. The Manhattan Bridge portion, costing not less than \$25,000,000, is nearly finished. The Williamsburg Bridge, costing almost as much, is already finished. The cost of these bridges does not come within total cost of the triborough system, for the policy has been not to include cost of bridges as part of rapid transit and not to expect any revenue from bridges. The city is committed to these links of the system. The fundamental question is not whether the city shall now begin the triborough system, but whether, having spent \$25,000,000, it shall spend a further amount to complete it. The opposition is now so hostile to construction of the trunk line of the triborough because it will be profitable; and when connected with the loop and Fourth Avenue subway will make profitable what may not be as profitable without articulation."

At the annual dinner of the Chamber of Commerce on Nov. 17, 1910, Mayor Gaynor in discussing the subway situation said:

"The city is now about to come to a decision in respect to one of the largest matters that ever confronted a government anywhere. I have not come to a decision yet, and shall not until I hear the case, as is my official duty. The case that confronts us is this: The city has only a limited amount of credit or money to put into subways. The question, therefore, is into what routes it should be put, so as to give the people of the city the largest result. Let me add that there is an immediate and pressing need of \$50,000,000 or more to do certain necessary public works other than subways. This enters into the question of how much we have available for subways. It is the intelligent public sentiment which is expressed by such men as compose the Chamber of Commerce which is to instruct the city officials and determine what they shall do. We do not intend to pay the slightest heed to clamor, however or wherever expressed."

As a member of the Chamber of Commerce John B. McDonald, the contractor who built the subway in New York now operated by the Interborough Rapid Transit Company, has written a letter to the chamber in which he upholds the objections of that body to the proposed triborough route, and favors the suggested extensions of the Interborough Rapid Transit company's system south from Times Square under Seventh Avenue and north from Forty-second Street under Lexington Avenue. Mr. McDonald does not believe that the construction of the triborough route would be for the best interests of the city on account of its great cost and the indefinite provisions for its equipment and operation.

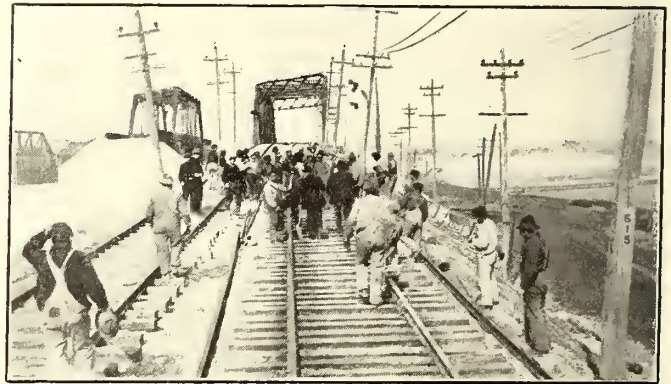
Frank J. Sprague has written a letter to the Public Service Commission suggesting: First, a compromise plan of subway extensions on a basis of city participation in all net profits after certain deductions; second, or failing this, an alternative plan for an independent line on which he is willing to guarantee a bid for operation, with the city sharing in both management and profits.

STATISTICS ON TRANSFERS IN NEW YORK STATE

Curran & Mead, of New York City, have recently compiled for the Street Railway Association of the State of New York some interesting statistics on the transportation furnished free by transfer tickets to the population of the State during recent years by the electric railway companies of the State. Allowing half a mile for each transfer ride the riding on transfers in New York State during 1907 would be sufficient to carry every man, woman and child in the City of Elmira or in Genesee County to California and back. The tickets would completely carpet an area four times as large as Niagara Falls Park, and if laid end to end would girdle the globe once and then reach from New York City to Calcutta.

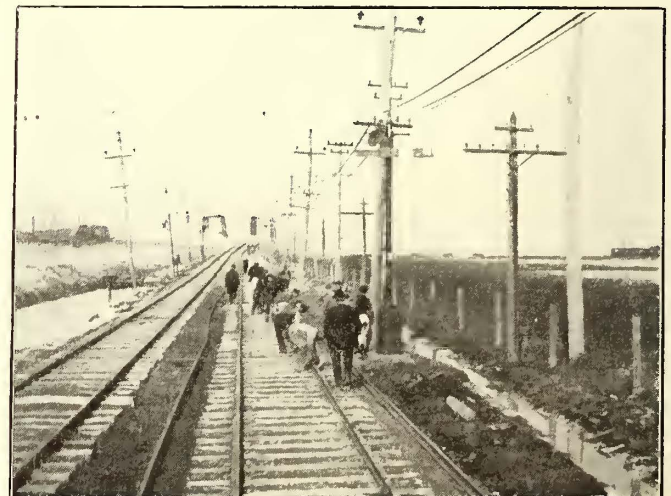
FAST TRACK LAYING ON THE SYRACUSE, LAKE SHORE & NORTHERN RAILROAD

The remarkable feat of removing three-quarters of a mile of 56-lb. rail and replacing it with 70-lb. rail in 21 minutes and 2 seconds was performed March 25, 1910, on a section of the Syracuse (N. Y.), Lake Shore & Northern Railroad between



Preparing to Install New Rails on the Syracuse, Lake Shore & Northern Railroad

Liberty Street, in Syracuse, and the Syracuse Railroad junction bridge. The exact length of track changed over was 3720 ft. Before starting on the work the new bonded rails were laid beside the old ones and the spikes were also distributed at con-



Spiking the New Rails to the Ties on the Syracuse, Lake Shore & Northern Railroad

venient distances. The job was done in such quick time that there was not the slightest delay in the operating schedule. The track gang which made this fine record was directed by Roadmaster W. A. Steckel.

MEETING OF THE EXECUTIVE COMMITTEE OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

A meeting of the executive committee of the American Electric Railway Transportation & Traffic Association was held at the association offices in New York Nov. 22. Those present were H. C. Page, Worcester, Mass., president; J. N. Shannahan, Baltimore, Md., first vice-president; H. C. Donecker, secretary; C. D. Emmons, Fort Wayne, Ind.; A. Gaboury, Montreal, Que.; C. E. Learned, Boston, Mass.; J. V. Sullivan, Chicago, Ill.

The question of subjects for papers and committee reports for the coming year was first considered. Mr. Shannahan moved that the draft of a proposed uniform transfer law or ordinance contained in the paper by L. S. Hoffman, read at the Atlantic City convention, be referred to the American Association for such action as it saw fit to take. The motion was carried.

Mr. Sullivan suggested a number of general subjects for consideration. These were referred to the committee on subjects.

A. W. Brady, president of the American Association, suggested as a subject for committee work the consideration of signals and signaling for interurban railways. This subject was considered tentatively by the executive committee of the Engineering Association last week, and Mr. Emmons moved that a joint committee consisting of three members of the Transportation & Traffic Association and three members of the Engineering Association should be appointed to take up the question. The motion was carried and Mr. Page was instructed to confer with Mr. Harvie, president of the Engineering Association, in making the appointments and outlining the scope of the committee's investigation.

CITY RULES

The committee on city rules was instructed to consider rules for prepayment cars and to confer with the committee on interurban rules regarding conflicting rules.

INTERURBAN RULES

The committee on interurban rules was instructed to ascertain what action had been taken or was contemplated by the State and national commissions which would affect the use of a standard code of interurban rules.

TRAINING OF TRANSPORTATION EMPLOYEES

This committee was instructed to make a similar investigation of legislation or commission orders affecting the employment of trainmen. It was also instructed to consider the following phases of employment methods: Time required to break in for motormen and conductors in city and interurban service. Uniform blanks for recording records of breaking in. Methods of keeping permanent records of employees.

PASSENGER TRAFFIC

The committee was instructed to consider the promotion of steady traffic throughout the year, inasmuch as this committee in the past has devoted its efforts principally to describing methods of promotion for special excursion and summer business and the operation of parks.

EXPRESS AND FREIGHT TRAFFIC

The Accountants' Association having suggested the appointment of a joint committee to consider the classification of express and freight accounts recommended by the committee on express and freight traffic at the Atlantic City convention, the president was instructed to appoint three members of such a joint committee. The standing committee will devote its attention to the development of express and freight traffic. The committee was also instructed to investigate State laws and municipal franchises relating to the operation of freight and express service and, if possible, to recommend reasonable and uniform restrictions and regulations.

TRANSFERS AND TRANSFER INFORMATION

This committee was instructed to follow up any new transfer laws and ordinances which may result from the suggestion of Mr. Hoffman, made at the Atlantic City convention, and to report on new transfer methods. The committee will also consider methods of issuing and collecting transfers on prepayment cars.

CONSTRUCTION OF SCHEDULES AND TIMETABLES

Among the subjects referred to this committee for further consideration at the Atlantic City convention were the following: Define "tripper" and "extra," and other terms. Basis of calculating schedule speed. Assignment of work as called for by schedules. The committee this year will devote special attention to the problems of constructing schedules and timetables for interurban roads.

ASSOCIATE MEMBERSHIP

The secretary explained the proposed method of increasing the associate membership affiliated with the Transportation & Traffic Association. The president was authorized to appoint a committee on associate membership in accordance with the plan suggested by President Brady of the American Association.

JANUARY MEETING

It was voted that a meeting of the executive committee should be held in January at the time of the mid-winter meeting of the American Association. At this meeting the chairmen of the standing committees will be expected to report what progress has been made in the work assigned to them. The chairmen of the standing committees will report to the secretary after each committee meeting so as to keep him in touch with the work of the committees. The secretary was instructed to follow the work of the sectional associations and take such steps as may be necessary to have the Transportation & Traffic Association represented at these meetings.

CONVENTION OF NATIONAL SOCIETY FOR PROMOTION OF INDUSTRIAL EDUCATION

The fourth annual convention of the National Society for the Promotion of Industrial Education was held at Boston from Nov. 17 to 19, inclusive. It was largely attended by educators, publicists, industrial executives and others interested in the better training of juvenile and youthful workers. Several papers were read bearing upon mercantile, trade school, apprentice course, factory and special evening instruction facilities. Prominent among these were a paper by Tracy Lyon which described the apprentice course of the Westinghouse Electric & Manufacturing Company; a paper by F. W. Thomas upon the apprentice course of the Atchison, Topeka & Santa Fé Railroad; a description by George C. Cotton of the mechanics' educational course of the Solvay Process Company, and a discussion by G. M. Basford of the system for preparing recruits in the service of the American Locomotive Company. All the speakers voiced the need of first-class skilled mechanics rather than the dearth of mechanical draftsmen and technical graduates. The Westinghouse courses aim to produce all-around mechanics, with encouragement of latent efficiency in handling specialized tools. The Atchison, Topeka & Santa Fé Railroad spends about \$40,000 per year in training boys for future needs, but the result is that the recipients of the training accomplish enough more work to pay the cost of their instruction. The importance of paying a living wage to industrial apprentices was generally conceded. Part time and evening schools also received much attention at the convention, and an able address was delivered by Dr. Georg Kerschensteiner, of Munich, Bavaria, on "Continuation Schools." The final session was devoted to the broader economic aspects of industrial education, the principal speakers being Prof. T. N. Carver, of Harvard University; Miss E. B. Butler, of the Bureau of Research, New York, and C. H. Winslow, of the American Federation of Labor. A feature of the convention was a banquet tendered the society by the Boston Chamber of Commerce, ex-Governor Guild, of Massachusetts, presiding. Among the speakers were F. A. Delano, president of the Wabash Railroad, and F. P. Fish, chairman of the Massachusetts Board of Education and former president of the American Telephone & Telegraph Company. An elaborate exhibit of industrial educational courses, problems and apparatus was held at the Boston Public Library during the convention.

COMMUNICATION

THE STANDARD CODE OF INTERURBAN RULES

THE AURORA, ELGIN & CHICAGO RAILROAD COMPANY
WHEATON, ILL., Nov. 17, 1910.

TO THE EDITORS:

The code of interurban rules submitted by the 1910 interurban rules committee to the Atlantic City convention of necessity received only brief discussion and was referred back to the committee for further consideration.

The discussion, brief as it was, will be of benefit to the committee in its further considerations, but the subject of interurban rules is of too grave importance to receive anything but the most careful and painstaking attention and the interurban rules committee should receive the benefit of the best thought on the subject from the operating officials of interurban properties in all parts of the country. It would seem as if free expression of opinion by various operating men through the medium of the technical press would be of great value and no doubt the press would consent to give place to a number of views on the subject.

The report submitted did not attempt in any way to close the subject, but rather to furnish material for constructive discussion. From the views obtained so far it appears that the adherents to a straight American Railway Association code are few in number but strong in their belief that it is the only permissible code. Other operating men believe that the Denver code points the only way to salvation, while a third faction places its trust in a modified code combining many of the good features of both the American Railway Association and Denver codes. The code submitted to the Atlantic City convention was constructed along the latter lines and aimed to harmonize as far as possible the two sets of rules.

To construct a code of operating rules that will fit all interurban lines and meet widely divergent local conditions is manifestly impossible. Nevertheless, if the writer is not mistaken, discussion of the submitted codes from year to year has generally included reference to the inadaptability of various rules to the speaker's own particular road. The fact is forgotten apparently that the committee does not attempt to formulate a code that will meet all the varying conditions that obtain on the widely dissimilar roads of the country, but rather to furnish a basis upon which the local rule book may be founded, with such exceptions and additions as may be necessary. A full and free discussion of this important matter will be both interesting and helpful.

The rules committee is neither thin-skinned nor hidebound and will appreciate frank expressions from operating officials on the subject, be they for or against the submitted report. Let us have a goodly bunch of them before the snow plows start out.

J. W. BROWN,

Superintendent of Transportation.

PROPOSED BUENOS AYRES UNDERGROUND LINES

Permission has been given for the construction of two underground lines in Buenos Ayres to relieve the congested condition of the narrow streets of that city. One of the concessions is to the Anglo-Argentine Tramway Company, whose general plan is the construction of a double line uniting the Plaza de Mayo with the Plaza Once de Setiembre. The railway is to be 22 ft. below the level of the street. The tunnel will be formed of walls of cement and brick. The cars will seat a maximum of 60 passengers, and will be operated on the multiple unit system.

The other concession is granted to the Western Railway Company, which is authorized to extend its present lines from near the Calle Sadi-Carnot to a junction with the port lines of the capital, part of the route being on the surface. This company is also to construct a tunnel under the Plaza Once de Setiembre, as an extension of its lines, to provide for the quick transfer of passengers from its trains to the underground line of the Anglo-Argentine Tramway Company.

COMMITTEE ON ELECTRICAL WORKING OF AMERICAN RAILWAY ASSOCIATION

At the meeting of the American Railway Association at St. Louis, Mo., on Nov. 16 the committee on electrical working reported that, owing to the pressure of other work that had engaged the attention of the members of the committee, it had held no session during the last six months. The committee stated that at the spring session of the association to be held in New York City on May 17, 1911, it "hopes to present a general report upon the subjects intrusted to its care. For the present it can only report progress."

The members of the committee on electrical working are as follows: George Gibbs, (chairman), chief engineer of electric traction, Long Island Railroad; J. F. Deems, general superintendent motive power, rolling stock and machinery, New York Central lines; J. D. Isaacs, consulting engineer, Union and Southern Pacific systems; W. J. Harahan, assistant to president, Erie Railroad; C. S. Sims, second vice-president and general manager, Delaware & Hudson Company; L. C. Fritch, chief engineer, Chicago Great Western Railroad; E. H. McHenry, vice-president, New York, New Haven & Hartford Railroad.

CHANGE IN NAME OF THE MANUFACTURERS' ASSOCIATION

Secretary Keegan, of the American Street & Interurban Manufacturers' Association, has issued a notice to the members asking for a letter ballot on the amendment to the constitution by which the name of the association will be changed to American Electric Railway Manufacturers' Association. This change can be made by a vote of two-thirds of the members and is, of course, with the object of making the name accord with that of the American Electric Railway Association and its affiliated associations.

LIFE OF PAINT ON STEEL CARS

In the discussion of the paper by William Marshall on "Protection of Metal Equipment," which was read at the October meeting of the New York Railroad Club (see *ELECTRIC RAILWAY JOURNAL*, Oct. 29, 1910, page 913), John Gearhart, foreman painter of the Pennsylvania Railroad, gave some interesting figures on the life of paint and varnish on steel passenger cars. There have been built at the Altoona shops of the Pennsylvania Railroad since 1903 a total of 119 steel passenger cars. Of these 42 were dining cars, 9 were coaches and the rest were postal cars. In addition the Pennsylvania Railroad has had built in contract shops 455 steel passenger cars, making a total of 574 steel cars in service at the present time. The first 200 cars have been in service for more than three years, and while some rust has been found, on the whole the paint on the cars was in better condition to-day than it would have been on wooden cars in service for the same length of time. The first steel passenger car built at the Altoona shop was an experimental subway car for the Interborough Rapid Transit Company, which was completed in November, 1903. This car has been in service since that time in the New York subway and the following is the record of painting:

Dec. 10, 1903, received new.

Oct. 4, 1904, cut in and one coat of varnish.

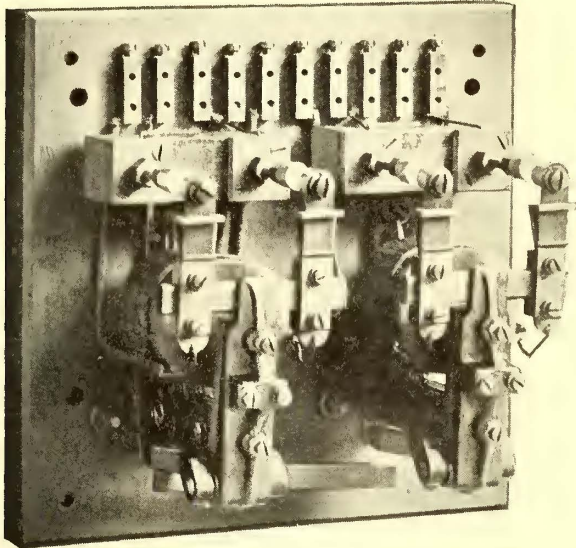
Jan. 30, 1907, two coats of Tuscan red and two coats of varnish.

July 3, 1909, two coats of enamel.

A recent examination of this car and about 30 others of a lot of 300 cars built about seven months after the first car showed that the paint was in first-class condition with no indications of rust. The first steel car built for the Pennsylvania Railroad was completed in June, 1906. In March, 1907, it was cut in and given two coats of varnish, and in March, 1909, it was given two coats of Tuscan red and two coats of varnish. The paint was examined early in October, 1910, and found to be in excellent condition.

A DRY TYPE RELAY

The Westinghouse Electric & Manufacturing Company has just brought out a new secondary or auxiliary relay for its induction regulators. The new relay is of the dry type, while the former was oil-immersed. The non-inductive resistance used in the old-style relay is employed with the new style, but



Auxiliary Relay for Induction Regulators

it is now built as a primary part of the relay instead. This resistance, permanently connected across the contacts, absorbs the inductive discharge of the coils at the moment of the breaking of contact and assists in eliminating sparking. The wearing parts are case-hardened for durability. The use of nickel for the relay contacts is a marked advancement, as it gives all the advantages of platinum at a negligible cost for renewals. The results obtained from the operation of motor-operated regulators by means of this relay are said to have been very satisfactory. The wear on the contacts is very slight, but in any event adjustments or renewals can be very easily effected.

A NEW INSULATING MATERIAL

An important addition to the field of insulating materials, called "Bakelite," has recently been placed on the market by the General Bakelite Company, New York. This substance is a synthetic product invented by Dr. L. H. Baekeland, who is well known among chemists for his work in the development of "Velox" and other photographic papers. Numerous experiments for the past two years have shown that "Bakelite" is very suitable for coil impregnation and all forms of molded insulation, but it is not recommended for flexible insulation as in taping. It is extensively used by large electrical manufacturers for third-rail and line insulators, transformer tubes, etc. This material is not only an insulator, but it is also made to replace Japanese lacquer, celluloid, hard rubber and even some forms of jewelry.

In its formation two strong-smelling liquid substances (carbolic acid and formaldehyde) react chemically upon each other and solidify to a transparent amber-like substance entirely devoid of odor and taste. The various uses of "Bakelite" will be better understood from the following description of some of its properties.

The final product, Bakelite C, is infusible and can resist temperatures of 572 deg. Fahr. (300 deg. C.) or over. It is insoluble in all solvents and can withstand strong chemicals, oil, hot water, steam, etc. These qualities, in conjunction with its dielectric properties, make it an excellent electrical insulator. It can be compounded with various filling materials and shaped or molded to articles of unusual strength. It can be sawed, turned and polished. It can be used to impregnate wood and

other porous bodies, rendering them harder and more resisting to chemical and physical influences. It can be obtained as transparent as glass or colored to suit special requirements.

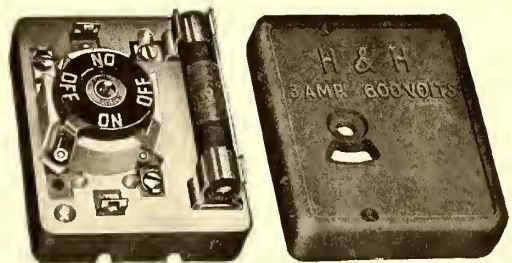
It does not emanate sulphur like hard rubber, nor nitrous products like celluloid, which have a very disturbing influence in some electrical applications. If heated in a flame it does not suddenly catch fire like celluloid nor melt like rubber; it simply chars, then burns with difficulty. Its specific gravity is about 1.25.

The manufacturing process involves the utilization of three distinct and well-defined varieties, designated Bakelite A, Bakelite B and Bakelite C. "C" is the final product, whereas "A" and "B" are the transition products, which enable the manufacturer to mold or otherwise apply the material before its final condition. The initial raw material "A" exists in liquid, pasty or solid condition. Every variety of "A," if heated at a sufficiently high temperature, changes into "B," then into "C." All varieties of "A," whether they be liquid, pasty or solid, are still soluble in alcohol, acetone or in caustic soda and behave as true resins. The intermediate solid product "B" is neither so hard nor strong as "C," and may be easily mistaken for "A," but it is different from the latter on account of its insolubility. "B" is specially characterized by the fact that although it is infusible it will soften under the action of heat and then will mold and weld together if pressed in a hot hydraulic press. The latter fact differentiates it clearly from "C."

The final product "C," resulting from the application of heat to "A" or "B," may be considered as a chemical polymer of "B" resulting from a multiple molecular grouping. It is no longer a resin, although physically it may resemble amber. It has the maximum strength and maximum resistance to chemical influences as previously noted.

BARRIER TYPE CAR LIGHTING SWITCH

The Hart & Hegeman Manufacturing Company, Hartford, Conn., has recently brought out the H. & H. barrier 600-volt car lighting switch, which represents a new application of the barrier principle in electric snap switches. The plates of this switch are swiftly rotated through the narrow inclosed slot in the porcelain barrier and effect a mechanical blow-out that permits the switch to break the circuit under very heavy overloads. The cartridge fuse is in circuit between the line and the switch and protects the incandescent lamps on the circuit from burn-outs. Special pains have been taken to make the switch mechanically strong, so that it will not break down under rough usage and will withstand the effects of the dust,



Car Lighting Switch

snow and moisture to which it is exposed by its position under the hood. The indicator showing whether the circuit is "on" or "off" is extra large and very legible. The steel spindle rotates in two steel bearings and all wearing parts are of hardened steel. The contacts are made of a special alloy to withstand the fusing effect of the arc. The porcelain parts are of glazed chocolate color and are strongly reinforced. The cover is tightly clamped on to prevent rattling. These railway car switches are made in single-pole, three-way and two-circuit types.

News of Electric Railways

Earnings of Cleveland Railway for October

The report of the Cleveland (Ohio) Railway for October, 1910, shows a surplus of \$11,111. This is the first surplus since May, and it is said to have been due to the business which the company did during the week of the Cuyahoga County centennial celebration. The passenger earnings were \$538,105, the greatest since the Tayler ordinance became effective. Including transfers, 21,517,678 passengers were carried, or 4500 more than during October, 1909. The report for October follows:

Gross receipts.....	\$550,835
Operating expenses.....	398,588
Net earnings.....	\$152,247
Income from other sources.....	2,861
Total income.....	\$155,018
Interest, taxes, etc.....	143,907
Surplus.....	\$11,111

The car mileage for October was 2,277,649. This gives an operating allowance of \$261,929 and a maintenance allowance of \$136,658. Figuring actual expenditures, there was a surplus of \$15,652 in the maintenance account, while in the operating allowance there was a deficit of \$7,165.

On Nov. 19, 1910, the directors of the company authorized a loan of \$200,000 to pay accrued debts. Of this \$110,000 has been appropriated to pay taxes under the receivership, including \$65,000 to be used to cover the excise tax from May, 1909, to about March 15, 1910.

Residents of the South End, headed by Councilman C. W. Shimmon, urge that a belt line route should be established when the new Denison-Harvard County bridge is completed. The East 105th Street cars should be routed over the new bridge to West Sixty-fifth Street, according to Mr. Shimmon. This would give a route between points on the lake front on the East and West Sides, passing through the outer portions of the city the entire distance. It would cost not less than \$150,000 to establish this line. J. J. Stanley, president of the company, states that a line across the bridge would accommodate people of Newburg and other near-by portions of the city, but that there is no money for such improvements now. As only \$400,000 of the new issue of \$1,500,000 of stock has been sold, the prospects for betterments and extensions are not particularly bright, especially as about \$2,000,000 would be required to carry out work which should be done.

First mortgage and collateral gold bonds to the amount of \$750,000 have been sold by the Shaker Heights Land Company. Of this, it is stated, about \$250,000 will be devoted to the extension of the Shaker Heights car line south and east of Coventry Road. This is the first time that any company in Cleveland has been called upon to build its own car lines to take care of new developments. Under the conditions imposed upon the Cleveland Railway, however, the company is unable to play any part in the development of the city.

Railway Affairs in Detroit

The case against the Detroit (Mich.) United Railway on the charge of violating a city ordinance by collecting an extra fare on the Jefferson Avenue line in Fairview since that village has been annexed to Detroit was argued before Judge Phelan of the Recorder's Court at Detroit, on Nov. 10, 1910. Assistant Corporation Counsel Weadock appeared for the city and Fred A. Baker for the company. Mr. Baker argued that the contract of the company with the city provides merely for carrying passengers within the city limits and that any litigation which involves this question should be brought in the civil court. Mr. Weadock insisted that as violations of the airbrake, vestibule and other ordinances were brought before the criminal courts the question of fares should also be brought in the same court. He also stated that separate cases, involving the fare question, would be brought for each day from the time of the annexation of the village to the date of the decision of the Supreme Court. About 60 such cases have already been

filed. Judge Phelan will be called upon to decide whether the Recorder's Court has jurisdiction in such cases and whether the Common Council has authority to enact an ordinance to enforce a contract. Mr. Baker insisted that the contracts made with Fairview and Gross Point relating to fare are valid as long as they run, notwithstanding the fact that these villages have been annexed by the city. Such matters should be brought before the city courts and not before the criminal court, as no crime has been committed, even if it should be decided that the terms of the contract have not been observed. Since the second decision of the Michigan Supreme Court in favor of the city on this question, the company has collected only one fare, and it will continue to collect only one fare until a decision has been rendered by the United States Supreme Court.

William B. Thompson, who was elected Mayor of Detroit at the recent election, is having a spirited contest with Precor K. Owens, his opponent, in a recount before the city canvassing board. Many mistakes have been found in the original count, but it is not expected that they will change the result. During the campaign Mr. Thompson frequently referred to the street railway situation in Detroit, but he has so far made no definite statement in regard to the conditions which he believes should govern the new grant to the Detroit United Railway.

Fender Specified for Use in Portland, Ore.

The Nelson ordinance specifying the type of fender that shall be used on street cars operated in Portland, Ore., after July 1, 1911, to which reference was made in the ELECTRIC RAILWAY JOURNAL of Nov. 19, 1910, page 1047, describes the device necessary to meet the requirements of the ordinance as follows:

"A fender located and attached to forward end of the car projecting therefrom at least 24 in., consisting of an apron composed of steel wire mesh, and a lifeguard or vertical fender of similar construction projecting at least 3 in. vertically in front of bumper or platform of car, the rear end of said apron or guard to be not less than 4 in. near or more than 12 in. above the top of rail, and said apron or guard to be not less than 24 in. long from its rear end to its front or forward edges, and to be of sufficient width to extend at least 6 in. outside of each rail of the track, the front edge of said apron to be formed of standard piping not more than 2 in. in diameter; said apron to be formed of steel wire mesh, the openings not more than 3 in. wide through or between the same; said apron to be attached to pistons working within cylinders, so that by an emergency application of the air through the motorman's air valve said apron will be thereby lowered and held on the rails by said air pressure within said cylinders; the said apron of said fender may have a projecting bar parallel with and in front of said apron, whereby when said bar comes in contact with any pedestrian on the track air will be thereby admitted into said cylinders controlling said fender and into cylinder controlling brake mechanism simultaneously. The motive power for actuating or compressing said apron or fender to the rails shall be straight or automatic air under instant control of the motorman or drive of said car by use of controlling valve which incorporates both fender and brakes; provided, however, that the apron may be in addition provided with means for operating said fender automatically as hereinbefore described."

Opening of American Museum of Safety

The formal exercises in connection with the opening of the permanent exhibition of the American Museum of Safety were held on the evening of Nov. 21, 1910, in the auditorium of the Engineering Association Building, New York. Philip T. Dodge presided. There are 12 museums of safety in Europe and one in Canada. The New York museum is the fourteenth of its kind. The object of the museum is to conserve human life, by providing a permanent exhibit of the best and most practicable de-

VICES for making safe the dangerous parts of machines and processes. President Taft expressed his interest in the work and stated that he did not know of any better method to bring about the use of such devices than to exhibit them. Greetings from Justice Charles E. Hughes, of the United States Supreme Court, Dr. Kaufman, president of the German Imperial Insurance Office, and directors of the European Museums of Safety were then read. Justice Hughes said that he had been deeply interested in the work of the museum from the outset and expressed the hope that the permanent exhibit would increase the interest in the protection of life and limb.

The gold medal offered by the Travelers' Insurance Company to the individual industrialist or corporation that had done the most to protect the lives and limbs of workmen was presented to the United States Steel Corporation and was accepted by W. B. Dickson, vice-president of the company. Prof. F. R. Hutton, chairman of the jury of award, announced that the trustees had awarded a gold medal, offered by the *Scientific American* for the best safety device exhibited at the museum, to the Safety Scaffolding Company, New York, for its design and construction of suspended platforms.

Dr. W. H. Tolman described the systems to insure the safety of employees which are used abroad, and T. C. Martin outlined the history of the American Museum. Other speakers were Edson S. Lot, president of the United States Casualty Company, and Dr. N. E. Ditman.

Arbitrators Selected at Winnipeg.—W. J. Christie was selected on Nov. 10, 1910, as the third member of the board of arbitration which is to consider the differences between the Winnipeg Electric Railway and its employees, to which reference was made in the *ELECTRIC RAILWAY JOURNAL* of Oct. 29, 1910, page 923. Captain Robinson has been selected to represent the company and Mayor Peletier, Fort William, has been selected to represent the employees.

Complaint Against Walkill Transit Company.—The Public Service Commission of the Second District of New York has received a complaint from the chairman of the street committee of the Common Council of Middletown against the Walkill Transit Company, Middletown, N. Y., alleging that the tracks and rails of the company on certain streets are out of repair, dangerous and unsightly. The commission is asked to order the company to put its tracks in shape for safe and comfortable operation.

Incidents in the Columbus Strike.—George W. Brady, alias Gerald O'Leary, has been brought to trial at Columbus, Ohio, on the charge of shooting two women in the riots which occurred during the strike of the employees of the Columbus Railway & Light Company. After the shooting Brady disappeared. He was captured in Cleveland and an indictment was found against him. The proprietor of a moving picture show at Kenton has been forbidden by the police to produce scenes of the riots in Columbus during the strike.

New Washington Street Tunnel Under Chicago River.—The reconstructed Washington Street tunnel under the Chicago River will shortly be opened for the passage of cars of the Chicago (Ill.) Railways. As originally built, this masonry tunnel was only 16 ft. below the mean level of water in the river, limiting the draft of vessels in the Chicago River at that point. The reconstructed tunnel is 26 ft. below the river surface. Parts of the original masonry walls of the structure were retained, the roof was taken off and rebuilt on steel girders supported on the walls and the floor lowered sufficiently to allow cars to pass. The tunnel is 1200 ft. long, of which 200 ft. is subaqueous. The west approach extends beneath the new terminal station of the Chicago & Northwestern Railroad. The track grade is 46 ft. below the river level, and the bore section measures 16 ft. x 25 ft. The reconstruction work was done by George W. Jackson, Inc., Chicago, Ill.

Amendments Suggested to Cleveland Subway Grants.—George W. Kinney, president of the Cleveland Chamber of Commerce, has suggested to the City Council certain amendments to the subway ordinances granted recently to the Cleveland Underground Rapid Transit Railroad and has asked for a hearing before the committee on railroads of the Council. One of the amendments suggested is that the upper

subway in the free territory of the city be of sufficient width and depth to admit the operation of surface cars; another would provide power to inspect the books and accounts of the company, with special reference to the cost of construction, to the end that the investment may be accurately ascertained, and a third would provide for the validity of the purchase and licensee provisions of the ordinance. The City Council, it is stated, will not pass these proposed amendments unless the case now in the Supreme Court is decided against the city. The City Council repealed the subway ordinances, but the company declared they were still valid because they had been accepted before the repealing ordinance was passed. To adopt amendments, it is asserted, would be to acknowledge that the ordinances are valid.

Transit Improvements Considered in Indianapolis.—On Nov. 10, 1910, the directors of the Commercial Club of Indianapolis and the members of the Board of Works of that city considered the report of a special committee of the club regarding street railway improvements in Indianapolis. The directors of the club urged the Board of Works to require the Indianapolis Traction & Terminal Company to hasten the work of paving between tracks and to build a cross-town line. Members of the Board of Works claimed that a cross-town line was not needed at present, and that the company was paving between the tracks as rapidly as possible. There were many things to be done in the way of paving, building cross-town lines and making extensions. The company was only able to do part of the work at once. The committee states that when the Indianapolis company accepted its franchise in 1902 it agreed to build two cross-town lines in Indianapolis by 1905, one on the north side and the other on the south side. Routes named in the franchise have been considered impractical by the succeeding administrations, and no definite action has been taken regarding the selection of new routes.

Decision Regarding Right of Interurban Railway to Parallel Steam Railroad.—The Lake Shore & Michigan Southern Railroad brought suit against the Chicago, Lake Shore & South Bend Railway in the Elkhart Circuit Court recently, alleging that the Chicago, Lake Shore & South Bend Railway paralleled its road from South Bend to Gary, and that the high tension wires of the Chicago, Lake Shore & South Bend Railway interfered with the transmission of messages over its telegraph lines. An injunction was requested to forbid the operation of the electric railway until it had installed devices to correct the inductive effect of its high-tension lines. The court has denied the injunction on the ground that the defendant is making lawful use of the franchise conferred upon it by the statute, and that such an act cannot be considered as a nuisance in itself; that in the exercise of such franchise no negligence has been shown and no wanton or unnecessary disregard of the rights of the complainant; that the damages occasioned are not the direct consequence of the construction of the defendant's road, but are merely incidental resulting from the operation and not recoverable. The plaintiff has appealed from this finding.

The Massachusetts Railroad Commission gave a hearing on Nov. 16, 1910, upon the appeal of the Boston (Mass.) Elevated Railway against the action of the Cambridge Water Board by which the latter refused to agree to the relocation of an important water main in Massachusetts Avenue, Boston, according to plans proposed by the Boston Elevated Railway in connection with the building of the Cambridge subway. It developed at the hearing that the chief issue is the agreement of both parties upon a solution of the problem and the case was held open to permit further technical conferences. The company maintained that the water board did not give it the legal determination of the problem to which the statutes entitle it and contended that it had no right to condemn private property for the relocation of water mains. Counsel for the company have also filed a brief declaring against the passage of a law requiring street railways to interchange cars on the grounds that such a statute is not needed; that the Boston Elevated Railway is already receiving the cars of foreign companies and that a general interchange is undesirable on the ground of safe operating.

Financial and Corporate

New York Stock and Money Market

Nov. 21, 1910.

The Wall Street market for the past week has been highly professional. Although prices have not declined during the week until to-day, the feeling in the financial district is not one of strength or confidence. It is generally believed that the market has been oversold and that prices are being artificially maintained on this account. Trading is very dull and outsiders are taking practically no part at all.

The demand for bonds is still very light, but the money market is remarkably easy for the season. Quotations to-day were: Call, 2½@2¾ per cent; 90 days, 4¼@4½ per cent.

Other Markets

Rapid Transit and Union Traction issues have both been active in the Philadelphia market during the past week, stimulated, undoubtedly, by the near approach of an agreement upon a plan of refinancing along the lines suggested by Mr. Stotesbury. Prices for both issues have advanced slightly.

In Boston there continues to be an active market for Boston Elevated and the Massachusetts Electric issues. These stocks are strongly held, but prices are very little higher than the former quotations.

Chicago Railways certificates, Series 1 and 2, have been in the market almost every day during the past week, but there have been only small lots offered. Prices are somewhat stronger, the former showing a net gain of six points on the week and the latter more than two points.

In Baltimore a few lots of Railways certificates have been sold at about 15. The bonds continue active at the former prices.

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

	Nov. 15.	Nov. 22.
American Railways Company.....	43	43
Aurora, Elgin & Chicago Railroad (common).....	a45	a45
Aurora, Elgin & Chicago Railroad (preferred).....	a89½	a90
Boston Elevated Railway.....	a128½	a129½
Boston & Suburban Electric Companies.....	16½	a16½
Boston & Suburban Electric Companies (preferred)...	72	a72
Boston & Worcester Electric Companies (common)...	*10½	a10
Boston & Worcester Electric Companies (preferred)...	*43	a41
Brooklyn Rapid Transit Company.....	77¼	78
Brooklyn Rapid Transit Company, 1st pref. conv. 4s..	83¼	83½
Capital Traction Company, Washington.....	a128½	a128
Chicago City Railway.....	*170	*170
Chicago & Oak Park Elevated Railroad (common)...	*3¼	*3¼
Chicago & Oak Park Elevated Railroad (preferred)...	*7¼	*7¼
Chicago Railways, pteptg., ctf. 1.....	a76	a82¼
Chicago Railways, pteptg., ctf. 2.....	a20½	a22¾
Chicago Railways, pteptg., 3.....	a11	a11
Chicago Railways, pteptg., ctf. 4.....	a5½	a6
Consolidated Traction of New Jersey.....	a74	a74
Cleveland Railway.....	*91½	*91½
Consolidated Traction of N. J., 5 per cent bonds.....	a104	a104
Detroit United Railways.....	a57	a57
General Electric Company.....	153	156¼
Georgia Railway & Electric Company (common).....	a120	a118
Georgia Railway & Electric Company (preferred)...	a89	a88
Interborough-Metropolitan Company (common).....	21	20¾
Interborough-Metropolitan Company (preferred)...	57½	56
Interborough-Metropolitan Company (4½s).....	80¾	80¾
Kansas City Railway & Light Company (common)...	a23	a21¼
Kansas City Railway & Light Company (preferred)...	a75	a75
Manhattan Railway.....	a142	141½
Massachusetts Electric Company (common).....	a20½	a20½
Massachusetts Electric Companies (preferred).....	a87¾	a88¾
Metropolitan West Side, Chicago (common).....	*21	a21
Metropolitan West Side, Chicago (preferred).....	*64	a68
Metropolitan Street Railway.....	*22	*22
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	65½	*65½
Northwestern Elevated Railroad (common).....	a20	a22
Northwestern Elevated Railroad (preferred).....	a60	a60
Philadelphia Company, Pittsburg (common).....	a45½	a45½
Philadelphia Company, Pittsburg (preferred).....	a41½	42
Philadelphia Rapid Transit Company.....	a16½	a18
Philadelphia Traction Company.....	*82	*82
Public Service Corporation, 5 per cent col. notes.....	a95	a95
Public Service Corporation, ctf. s.....	a101	a101
Seattle Electric Company (common).....	a107½	a107½
Seattle Electric Company (preferred).....	a102½	a103
South Side Elevated Railroad (Chicago).....	*65	a65
Third Avenue Railroad, New York.....	12¾	a12¾
Toledo Railways & Light Company.....	a10	*10
Twin City Rapid Transit, Minneapolis (common).....	a10½	a108½
Union Traction Company, Philadelphia.....	130¾	a41¾
United Rys. & Electric Company, Baltimore.....	*15½	a15
United Rys. Inv. Co. (common).....	*14¾	*14¾
United Rys. Inv. Co. (preferred).....	*60	57
Washington Ry. & Electric Company (common).....	a36½	a34
Washington Ry. & Electric Company (preferred)...	a90	a87½
West End Street Railway, Boston (common).....	87½	a90½
West End Street Railway, Boston (preferred).....	*100¾	*100¾
Westinghouse Elec. & Mfg. Company.....	71	71¾
Westinghouse Elec. & Mfg. Company (1st pref.).....	124	*124

a Asked. * Last sale.

Proposed Reorganization of Washington, Baltimore & Annapolis Electric Railway

The committee, consisting of George T. Bishop, J. L. Sevrance, Hinsdill Parsons, George A. Craig, John Sherwin and J. J. Nelligan, which has recently prepared a plan for the reorganization of the Washington, Baltimore & Annapolis Electric Railway, Washington, D. C., has issued a circular which gives in detail the terms of the readjustment. As stated in the ELECTRIC RAILWAY JOURNAL of Nov. 19, 1910, page 1044, it is proposed to organize a new company with total authorized capital liabilities of \$13,000,000, of which \$7,500,000 is to be first mortgage bonds, \$2,500,000 6 per cent non-cumulative preferred stock and \$3,000,000 common stock. At present \$5,000,000 of bonds will be issued, \$1,460,000 of preferred stock and the entire amount of common stock. This will leave unissued \$2,500,000 of first mortgage bonds, and \$1,040,000 of 6 per cent non-cumulative preferred stock.

Holders of the second mortgage bonds will have the right to subscribe for \$100,000 of preferred stock with a bonus of \$500,000 of common stock, and holders of the preferred stock will have the right to subscribe at par for \$500,000 of preferred stock with a bonus of \$2,500,000 of common stock. The right of stockholders to subscribe for preferred stock, however, is qualified as follows: "Stockholders may subscribe for preferred stock in an amount equal to 10 per cent of their present holdings, but the committee reserves the right to reduce all subscriptions to 8 per cent of their present stock holdings, the same being necessary in case more than 86 per cent in amount of stockholders subscribe."

The circular says further:

"In cases where a subscriber is entitled to a fractional share, and where such fraction exceeds a half share, he will be permitted to underwrite a full share. In cases where the fraction is less than a half share, the right to subscribe will be reduced by such fractional amount. Subscription rights are available only on deposits of second mortgage bonds and stocks.

"Of the indebtedness contracted prior to and under the receivership, approximately \$400,000 thereof is of a nature to require the payment of the same in cash upon reorganization, representing payment in full for 10 new cars, cost of Lombard Street freight terminal, reconstruction of tracks of Washington Railway & Electric Company so as to permit operation of the railway company's cars in Washington, and costs of receivership.

"The issue of bonds, par for par, as to principal to the railway company first mortgage bondholders and to the Terminal bondholders, and of preferred stock for interest, liquidates in full the entire amount due on all such bonds, and gives the holders thereof interest and dividend-bearing securities. The issue of \$400,000 preferred stock to the second-mortgage bondholders, with the right to subscribe for an amount of underwriting equal to 1-10 of the par value of their bonds, should fully protect the equity of the second-mortgage bondholders, and give them a chance to participate in the anticipated development of the property. The allotment of the remainder of the underwriting to the present stockholders gives to them an opportunity (1) to acquire dividend-bearing securities for the new capital (2) to preserve a stock control."

The circular also comments on the prospects of the reorganized company. References are made to the substitution of the 1200-volt direct-current system for the alternating current system, to the operation of through cars to the downtown district in Washington and to the advance in fares, all of which took place on March 1, 1910. The results of operation since March 1, 1910, it is stated, indicate that for the year which will end with February, 1911, the net earnings should equal the amount which will be required the following year for interest and taxes and leave a surplus of approximately \$60,000, or slightly more than 4 per cent on the new preferred stock of the company. Continuing, the circular says:

"The properties are at present encumbered by mortgage indebtedness to the amount of \$6,145,000, with an outstanding capital stock of \$5,783,000. The new company will have an outstanding bond issue of \$5,000,000, preferred stock of

\$1,460,000, common stock of \$3,000,000, with \$217,000 of bonds and ample cash as working capital in the treasury, the reduction in outstanding capitalization exceeding \$2,500,000."

After Nov 29, 1910, bonds of the Baltimore Terminal Railway and first and second mortgage bonds of the Washington, Baltimore & Annapolis Electric Railway will be received for deposit by the Cleveland Trust Company, Cleveland, Ohio, and the Safe Deposit & Trust Company, Baltimore, Md., as depositories only on the payment of \$10 for each bond deposited, and stock of the Washington, Baltimore & Annapolis Electric Railway will be received for deposit only upon the payment of 25 cents per share.

Southern Pacific Acquires Pacific Electric Railway

The property of the Pacific Electric Railway has been acquired by the Southern Pacific Railroad, while all the holdings of the Los Angeles Railway are now for the first time owned by Henry E. Huntington. An official statement says:

"For several years past the Southern Pacific Railroad has owned 45 per cent of the stock of the Los Angeles Railway and Mr. Huntington the balance. The stock of the Pacific Electric Railway has been owned equally by Mr. Huntington and the Southern Pacific Railroad. Mr. Huntington now acquires from the Southern Pacific Railroad its 45 per cent of the stock of the Los Angeles Railway and thus becomes its sole owner, while the Southern Pacific Railroad in turn buys out Mr. Huntington's half interest in the Pacific Electric Railway and thus becomes its exclusive owner. Furthermore, the Southern Pacific Railroad acquires control of the interurban portion of the Los Angeles & Redondo Railway, lying between Hawthorne and Redondo, while the urban portion between Hawthorne and Los Angeles will hereafter belong to and be operated by the Los Angeles Railway.

"Mr. Huntington's new interests have been reorganized under the corporate name of Los Angeles Railway Corporation, having a capitalization of \$20,000,000, with the active management in the hands of his son, Howard E. Huntington.

"The details of the reorganization of the Pacific Electric Railway have not been arranged. The new name may be Pacific Electric Corporation. The Los Angeles-Pacific Company, the old Clark-Sherman system, which was purchased by the Harriman interests several years ago and is now in charge of Robert C. Gillis, will probably lose its identity in consolidation. The electric railways in Ontario, Redlands, San Bernardino and Riverside are now part of the new Southern Pacific electric system in Southern California. The present capitalization of the Pacific Electric Railway is \$10,000,000, but it owns assets costing several times that amount.

"Negotiations in the readjustment of electric railway ownership above indicated were carried on for Mr. Huntington by himself and his personal attorney, William E. Dunn, and for the Southern Pacific Railroad by William F. Herrin, vice-president and head of its legal department; J. W. McKinley, its Los Angeles counsel, and Col. Epes Randolph.

"The ownership of the 10-story Pacific Electric Building at Sixth Street and Main Street, Los Angeles—the entrepot of the Pacific Electric system in the metropolis—is also transferred to the Southern Pacific Railroad.

"Mr. Huntington's recent acquisition of the urban lines of the Pacific Electric Railway in Los Angeles and granting to his patrons universal transfer privileges is a part of the new order of things."

Speaking of future plans, Mr. Dunn said:

"It is apparent that the Southern Pacific Railroad's attitude is to extend the Huntington liberal policies in future construction and operation. This will mean much to Southern California. I have heard it stated that, assuming that \$25,000,000 or \$30,000,000 have been invested in the Pacific Electric Railway up to date, as much more will have to be put in to keep the system moving with the development of the regions it serves."

The new directors of the Pacific Electric Railway are: W. F. Herrin, president; Paul Shoup, vice-president; William Hood, Walter F. X. Parker, J. W. McKinley, Col.

Epes Randolph, R. C. Gillis. The retiring directors are H. E. Huntington, Howard Huntington and G. C. Ward. The new directors of the Los Angeles & Redondo Railway are Paul Shoup, Guy V. Shoup, Walter F. X. Parker, J. W. McKinley and W. C. Martin. The retiring directors are H. E. Huntington, Howard Huntington, G. C. Ward, C. A. Henderson and W. E. Dunn. The new directors of the Los Angeles Corporation are H. E. Huntington, president; Howard Huntington, vice-president and general manager; W. E. Dunn, Albert Crutcher, J. E. Brown, C. A. Henderson and G. C. Ward. Those who resigned are W. F. Herrin, I. W. Hellman, Jr., and J. K. Harrington.

Atchison Railway, Light & Power Company, Atchison, Kan.—The Atchison Railway, Light & Power Company has filed for record the mortgage for \$1,500,000 covering its property, to which reference was made in the *ELECTRIC RAILWAY JOURNAL* of Oct. 29, 1910. The Federal Trust Company is trustee under the mortgage.

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga.—The Augusta-Aiken Railway & Electric Corporation has been incorporated under the laws of Maine with an authorized capital stock of \$3,750,000 as successor to the Augusta-Aiken Railway & Electric Company, the purchase of a controlling interest in which by Redmond & Company, New York, N. Y., was noted in the *ELECTRIC RAILWAY JOURNAL* of July 23, 1910, page 162. All of the 5 per cent collateral trust bonds of the Augusta-Aiken Railway & Electric Company, dated 1903, which are outstanding have been called for payment at 105 and interest on Jan. 1, 1911, at the office of the Baltimore Trust Company, Baltimore, Md.

Gary & Interurban Railway, Gary, Ind.—The unsold portion of the present issue of \$1,000,000 of first refunding mortgage 5 per cent gold bonds of the Gary & Interurban Railway, dated July 1, 1910, and due July 1, 1930, but callable at 105 and interest, is being offered at 95 and interest by Lawrence Barnum & Company, New York, N. Y. The Western Trust & Savings Bank, Chicago, Ill., is trustee under the mortgage which secures the bonds.

Georgia Railway & Electric Company, Atlanta, Ga.—J. H. Hilsman & Company, Atlanta, Ga., have purchased \$225,000 of the refunding and improvement 5 per cent mortgage bonds of the Georgia Railway & Electric Company, forming part of the \$1,250,000 of bonds which the Georgia Railroad Commission in April, 1909, authorized the company to issue. Of these bonds \$1,000,000 were previously outstanding.

Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.—The property of the Indianapolis & Cincinnati Traction Company was purchased at foreclosure recently by John J. Appel, representing the bondholders, and a company to be known as "The Indianapolis & Cincinnati Traction Company" has been incorporated with an authorized capital stock of \$3,000,000 and an authorized bond issue of \$1,300,000, to succeed the Indianapolis & Cincinnati Traction Company. Thus the only difference between the name of the old company and the successor company is in the word "The." The following directors have been elected for the successor company: W. T. Durbin, W. J. Alford, Anderson, Ind.; T. F. Rose, George A. Ball, Munsey, Ind.; John J. Appel, J. F. Wild and Charles L. Henry, Indianapolis, Ind.; W. M. Frazee, Rushville, and John R. Beasley, Terre Haute, Ind. The officers of the successor company are: Charles L. Henry, president and general manager; T. F. Rose, vice-president, and John F. Wild, secretary and treasurer.

Interstate Railways, Philadelphia, Pa.—In the *ELECTRIC RAILWAY JOURNAL* of Nov. 19, 1910, page 1044, mention was made of the special meeting of the stockholders of the Interstate Railways which has been called for Nov. 25, 1910, to vote on a plan to issue \$1,000,000 of preferred stock at par, the proceeds to be used to liquidate the company's floating indebtedness and to pay overdue interest and the coupons due on the bonds in February. The new stock is to be divided into 100,000 shares of a par value of \$10 each and the dividends are to be at the rate of 6 per cent, cumulative from the date of issue. This stock is to have preference over the common stock, both as to dividends and assets, and is to be redeemed and retired at par before any dividends are paid on the common stock. Subscription agreements which have been addressed to the stockholders

and the bondholders of the company ask the stockholders to subscribe to \$500,000 of the proposed issue of preferred stock at par, payable in five installments of 20 per cent each beginning Dec. 15, 1910, and ending April 1, 1910, and ask the bondholders to accept the preferred stock at par for the 1910 and 1911 coupons. If these plans are accepted, the opinion is expressed that the company will be able by Feb. 1, 1912, to resume the payment of coupons at the regularly stated periods.

Louisville & Eastern Railroad, Louisville, Ky.—Judge Walter Evans, of the Federal Court at Louisville, has entered an order which provides for the sale of the Louisville & Eastern Railroad, which has been in the hands of a receiver for more than a year. Thomas Branham has been appointed commissioner to conduct the sale within 30 days. The motion to sell the road was made by Judge Alex P. Humphrey, acting for the bondholders. It is expected that the Louisville Railway, which has bought a majority of the outstanding claims against the company, will purchase the property at the sale.

San Francisco, Vallejo & Napa Valley Railway, Napa, Cal.—A. W. Fox, Harrogate, Eng., has applied for a receiver for the San Francisco, Vallejo & Napa Valley Railway.

Sherbrooke Railway & Power Company, Sherbrooke, Que.—McCuaig Brothers & Company, Boston, Mass., offer for sale at 95 and interest carrying a bonus of \$400 par value of stock with every \$1,000 of bonds a limited amount of 5 per cent consolidated first mortgage sinking fund bonds of the Sherbrooke Railway & Power Company. The bonds are dated July 1, 1910, and are due July 1, 1940. An annual cumulative sinking fund of 1 per cent of the total outstanding issue of bonds is provided to commence July 1, 1916.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, $1\frac{1}{2}$ per cent.

Brooklyn (N. Y.) Rapid Transit Company, quarterly, $1\frac{1}{4}$ per cent.

Kansas City Railway & Light Company, Kansas City, Mo., quarterly, $1\frac{1}{4}$ per cent, preferred.

Norfolk Railway & Light Company, Norfolk, Va., $2\frac{1}{2}$ per cent.

Pensacola (Fla.) Electric Company, 3 per cent preferred.

Rochester Railway & Light Company, Rochester, N. Y., quarterly, $1\frac{1}{4}$ per cent, preferred.

St. Joseph Railway, Heat, Light & Power Company, St. Joseph, Mo., quarterly, $1\frac{1}{4}$ per cent, preferred; quarterly, $\frac{1}{2}$ of 1 per cent, common.

About 65 exhibitors have contracted to take space at the electrical show which is to be held at the Coliseum, Chicago, Ill., on Jan. 7 to 21, 1911. The general scheme of interior decoration and lighting will be different from anything heretofore attempted. It will represent a noonday effect, the ceiling of the large building being treated and lighted to represent a bright daylight sky with a few fleecy clouds. Consistent with this conception will be the placing of all exhibits under vine-covered trellises, giving the appearance of arbors. A 500-watt tungsten lamp will be suspended from the arbor over the center of each exhibit space and smaller tungsten lamps will surmount the posts connected with the railing surrounding the exhibits. As in former years, the central-station exhibit of the Commonwealth Edison Company will form a conspicuous feature of the show. The space at the north end of the building heretofore allotted to this company will be used again. The idea of this year's Edison display will be a representation of a section of a street with a 7-ft. sidewalk, street lamps and six stores. The street lamps will consist of six posts, each supporting four or five 60-watt tungsten lamps in round frosted-glass globes. These posts are of the type adopted as standard for the various special street-lighting installations in Chicago. Commonwealth Edison Avenue is the name given to this "street," and each of the stores fronting on it will be of fairly good size, with two show windows and a central entrance. One of them will be a lamp shop. Another store will be a model grocery. A third store will be a shop for the display of domestic electric appliances of all kinds.

Traffic and Transportation

Sale of School Tickets in Portland

Early in 1910 the Portland Railway, Light & Power Company, Portland, Ore., with the approval of the School Board of Portland modified its rules which governed the sale of tickets to children and persons attending school. Subsequently the City Council of Portland adopted a resolution to instruct the City Auditor of Portland to address a communication to the company requesting it to discontinue the regulation then in force restricting the sale of street car tickets to those attending school and to adopt the system which had previously been in use.

Upon his return to Portland from the East B. S. Josselyn, president of the company, under date of Oct. 24, 1910, addressed a letter to the City Auditor, in which he said:

"We have concluded to modify our regulations in regard to the sale of these street car tickets to school children, as set forth in copy of my letter to F. D. Hunt, traffic manager of this company, which follows. Inasmuch as the change from 16 to 20 years in the age of school children entitled to the tickets and the permitting of one or more children in the same family to travel on the same book will remove the main difficulties complained of, I trust there will be no further objection to permitting the rest of the regulations concerning these school tickets to stand as issued."

On the same date Mr. Josselyn addressed a letter to F. D. Hunt, traffic manager of the company, in which he reviewed the conferences which had been held with the School Board in regard to the changes in the fares of school children and called attention to the advertisements carried by the company in the daily papers to acquaint the public with the changes in school fares for 1910-11. This letter Mr. Josselyn concluded as follows:

"The issuance of school tickets at reduced rates by the company is a gratuity on our part, and it seems to me that we should be permitted in granting a gratuity to surround it with such safeguards as we deem proper, in order that improper use may not be made thereof; and notwithstanding the request of the City Council that we return to the old method for selling school tickets, I feel that if we modify our regulations to some extent and overcome the main objections raised the City Council and the public will be satisfied.

"For the purpose of making these concessions, this will be your authority to change from 16 to 20 years the age limit of children to whom school tickets may be issued in order that pupils attending high school may be given the reduced rate. Also arrange to issue tickets hereafter so that any number of children in one family may use the same book of tickets, instead of requiring each child to procure a book for his or her independent use. You can keep a record of these tickets by charging the book first to one child and then to another, and so on, which will keep your record as desired. Of course, it will be necessary for all the children using a single book to board the car at the same time, for the tickets must not be detached except by the conductor.

"I do not think it advisable to sell tickets at more than one point, for we must have a complete record of all transactions at one place in order that no more than the number entitled to be sold to a person or family may go out."

Subsequently the company decided on the following conditions to govern the use and sale of school tickets in Portland and the 5-cent fare limits:

"The special school rate for pupils attending both public and private schools has been extended to include pupils up to and including 20 years of age, subject to the following conditions:

"Pupils attending school who will be entitled to the special school rate of 3 1-3 cents for continuous trip will be divided into two classes and for convenience will be designated as Class A and Class B.

"Class A will include pupils over 14 years but not over 20 years of age.

"Class B will include pupils 14 years of age and under.

"1. Tickets will be sold to pupils in Class A only upon presentation of a certificate of this company's issue, properly filled out. The certificate must bear the pupil's full

name, name of school attending and must be signed by the principal of such school.

"2. The certificates and tickets sold therein are not transferable and are for the individual use of the pupil to whom issued, and the tickets will not be accepted for the transportation of any other person. No two or more pupils will be permitted to use the same book of tickets; each pupil must be provided with an individual book of tickets for his or her individual use.

"3. Not more than three books of tickets will be sold on any certificate within any one month.

"4. Not more than one book of tickets will be sold on any certificate within a period of eight consecutive school days.

"5. Should a book of tickets be lost, another book of tickets will not be sold until the prescribed eight consecutive school days have expired.

"6. Should a certificate be lost it must be reported to the principal of the school by whom issued and by him reported to the traffic manager of the company before another certificate is issued.

"7. Certificates must be filled out and signed in ink.

"8. Certificates must be presented at ticket office each time tickets are purchased. Under no circumstances will tickets be sold for use of pupils more than 14 years to 20 years of age without a certificate properly filled out.

"9. Blank certificates will be furnished to principals on application to the traffic department.

"10. Certificates will not be required for children in Class B and it will not be necessary for each child to have an individual book.

"11. Tickets sold for use of children in Class B will be distinguished by a rubber stamp or printed impression of a 'crescent' on face of each ticket. Tickets stamped or printed in this manner will be good for passage if detached for children in Class B only; they will not be accepted for the transportation of any other person more than 14 years of age.

"The tickets sold at the special school rate named herein to pupils in both Class A and B are good for transportation to and from school only, on school days between the hours of 7:30 a. m. and 6 p. m. They will not be accepted for passage before 7:30 a. m. or after 6 p. m. or on Saturdays, Sundays, holidays, or when schools are not in session.

"All of the above conditions must be complied with under penalty of forfeiture of the reduced rate named herein.

"Certificates expire and tickets will be taken off sale at close of school season, June, 1911. Tickets will not be accepted for passage during closed school period.

"School tickets are sold in books of 33 coupons (single trips) at \$1 per book and are on sale at the company's ticket office only."

Commutation Rates Between Los Angeles and Recently Annexed Territory

Citizens of Hollywood and Colegrove, which are now part of Los Angeles, Cal., recently petitioned the Los Angeles-Pacific Company to place a 5-cent fare in effect between those places and Los Angeles, instead of the 10-cent fare. As noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 24, 1910, page 485, the company refused this request, but announced that it would establish a special commutation fare between Hollywood, Colegrove and Los Angeles. The company has now announced that on or about Jan. 1, 1911, it will place on sale 60-ride individual commutation tickets for \$3, good for 90 days; 30-ride family commutation tickets for \$2.10, good for 90 days, and 40-ride school commutation tickets for \$1.50, limited to the school term, for use between Los Angeles and Gardena Junction on the Hollywood line and Highland Avenue on the Colegrove line. The commutation tickets will be honored via any route and transfers will be issued to cars of the Los Angeles-Pacific Company in Los Angeles, Hollywood and Colegrove. On the same date the 5-cent fare will be extended from Arlington to Vineyard on the Sixteenth Street line.

In explanation of the change the company, through D. W. Pontius, traffic manager, addressed a letter to the Public Utilities Commission of Los Angeles in which the following statements are made:

"Desiring insofar as we consistently can to promote a good understanding and friendly feeling between the resi-

dents of the Hollywood and Colegrove sections and our company, an investigation has been made of the effect upon our revenue of the single trip 5-cent fare that has been requested and we regret that we cannot profitably carry on our business under that rate with conditions as they are, as the bulk of our business would be carried on under a rate yielding us only from $\frac{1}{2}$ to $\frac{3}{4}$ of a cent per mile. The country between is not yet thickly populated and we have no compensating short hauls, as in the case of city railways, to make up losses on the longer hauls.

"Annexation may become very widespread, consolidation of city and county government being even now contemplated, and obviously the interurban electric railways could not make effective a rate of 5 cents within such possibly enlarged limits and continue in business.

"In the character of our reconstruction work on the line to Hollywood, and in the improvement of our service to follow, we are trying to show the spirit of friendly co-operation with the residents of that section and hope that our side of the question may be considered by our Hollywood friends."

Near Side Stops in Baltimore

The following announcement is contained in *Trolley News*, which is published weekly by the United Railways & Electric Company, Baltimore, Md., regarding the plans of the company for complying with the city ordinance passed recently which requires all street railways which operate in Baltimore to stop their cars on the near side of the street:

"Beginning Friday, Nov. 25, the cars of this company will stop only at the near side of street crossings. On that day the ordinance requiring the street railway companies of Baltimore to make a uniform near side stop to receive and discharge passengers becomes effective.

"The riding public has already become accustomed to the near side stop at rapid transit crossings, as for some months past the cars of the United Railways & Electric Company have been stopping only at the near side of so-called rapid transit crossings.

"In order that there may be no confusion on the part of the public concerning the proposed change, attention is particularly directed to the fact that the requirement of the law is that a near-side stop is to be made at streets where there are no rapid transit crossings only on signal of either the conductor or a patron that a passenger wishes to get on or get off the car.

"Automobilists, teamsters and pedestrians should bear in mind that the motorman is not required to stop his car in crossing a street where railway lines do not intersect, except to allow passengers to board or alight.

"Until the public becomes accustomed to this new order of things, it is necessary that extra precaution should be exercised by drivers and the public generally. The public should be careful when approaching rapid transit lines either for the purpose of crossing or of boarding a car; and patrons are requested to wait for cars only on the near-side corner."

Women First in Boston.—The Boston (Mass.) Elevated Railway has posted on all its elevated stations signs which read: "Women first, please." The company has also posted in its elevated cars signs which read: "The company respectfully requests male passengers to give women precedence at stations."

Motorman Concerned in Wreck Insane.—B. F. Corkwell, a motorman of one of the cars of the Fort Wayne & Wabash Valley Traction Company which collided near Kingsland, Ind., on Sept. 21, 1910, has been adjudged insane and has been committed to the Eastern Hospital for the Insane at Richmond, Ind.

Car License Ordinance Introduced in Paterson.—The ordinance to require street railways which operate in Paterson, N. J., to pay a license of \$25 a year for every car operated in Paterson, to which reference was made in the *ELECTRIC RAILWAY JOURNAL* of Oct. 29, 1910, page 927, has been introduced in the Council and referred to the ordinance committee.

Through Service Between Michigan City and Indianapolis.—The Indiana Union Traction Company, Anderson, Ind.; the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., and the Winona Interurban Railway,

Winona Lake, Ind., established through service from the South Shore of Lake Michigan at Michigan City to Indianapolis, a distance of 175 miles, on Nov. 20, 1910.

Hearing on Fares in Niagara Falls Park.—The Provincial Board of the Queen Victoria Niagara Falls Park Commission will hold a hearing in Toronto, Ont., on Nov. 25, 1910, to consider the question of fares charged by the International Railway, which controls the Niagara Falls Park & River Railway, on its lines in Niagara Falls, Ont. It is claimed that the fares in force impose a burden on persons such as tourists who only use the company's lines occasionally.

Hearing on Withdrawal of Tickets in New Jersey.—The Public Utility Commission of New Jersey recently gave a hearing on the petition to require the Public Service Railway to restore the sale of tickets in books of 106 for \$5.00. The company reiterated before the commission the statements made in its letter to that body which was published in the *ELECTRIC RAILWAY JOURNAL* of Oct. 15, 1910, page 859. Briefly the company contends that the public demand for tickets at the rate of 21 for a dollar does not warrant the expense involved in printing and handling them; that tickets cannot be used readily with the fare boxes which it is installing; that street railway tickets are not on sale in other large cities, and that the ordinances under which the company operates authorize it to collect 5-cent fares. It was explained that school tickets made of paper are still sold, but that it is proposed to substitute metal disks for the paper tickets in the near future. The commission has not yet announced its decision in regard to the matter.

Calling Attention to Nature's Beauties Near Louisville.—The Louisville & Northern Railway & Lighting Company, Louisville, Ky., is constantly exploiting the advantages of electric transportation through the newspapers and billboards. The following advertisement of the company was published recently in a Louisville paper in a space 4 in. square: "See Nature in its truly wonderful work of tinting the forest leaves on Silver Hills. The great variety of forest trees here makes possible a multi-colored effect that is rarely seen. The cars wind around the hills for over a mile, affording many beautiful views. Be sure to see the view from the New Albany reservoir situated on top of the hill, the finest scenery around the Falls Cities. Take the big red car." In the lower left-hand corner this injunction was printed in type of a different face from the body of the advertisement: "Cars over Big Four and K and I bridges every 15 minutes from the depot—Third Street, near Walnut. Go one way, come back the other. Complete trip, 25 cents. Passengers taken on at any street along the route."

Plans for Improving Service in New Haven.—E. G. Buckland, vice-president of the Connecticut Company, New Haven, Conn., has addressed a letter to the committee on railroads of the City Council of New Haven in which he reviews at considerable length the plans which the company is making to improve service over its lines in New Haven. Effective on Nov. 21, 1910, it was proposed to adopt a schedule for all lines which would increase the frequency of cars 20 per cent. All cars which previous to Nov. 21, 1910, were run on a 12-minute headway and a 6-minute headway are hereafter to be run on a 10-minute headway and a 5-minute headway, respectively. Fifteen electric switches are being installed. Twenty-one new closed cars have been received by the company for use in New Haven and 14 cars are on order for delivery. The letter is concluded in part as follows: "Double-truck cars will be substituted for single-truck cars on the Fourth Street-Edgewood Avenue line as soon as the construction work is completed at the approaches to the new bridge over West River. Forty-six new double-truck, 15-bench open cars have been ordered for next summer. Delivery on these is promised by the builders, beginning in March, 1911, to be completed on or before June 15, 1911. There has been appropriated within the last year the sum of \$1,291,235.50 for additions and improvements on the New Haven system. In these improvements are the cars and electric switches heretofore mentioned, the cost of which aggregates \$499,618.50. We shall welcome the suggestions of your committee and of any citizen as to further improvements. I personally shall always be glad to receive such suggestions at my office."

Personal Attention

Mr. J. L. Adamson has resigned as general superintendent of the Geneva & Auburn Railway, Seneca Falls, N. Y.

Miss Grace E. Fitz has been appointed assistant treasurer of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.

Mr. Walter G. Parker, formerly electrical engineer of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., has been appointed superintendent of motive power and track of the company.

Mr. George W. Bowie, who has been superintendent of transportation of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., for several years, has been appointed general superintendent of the company.

Mr. Kenyon B. Conger, whose election as assistant secretary of the Hudson & Manhattan Railroad, New York, N. Y., was announced in the *ELECTRIC RAILWAY JOURNAL* of Nov. 12, 1910, succeeds Mr. W. J. Martin, resigned.

Mr. Alfred J. Sweeney, who has been superintendent of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., has been appointed assistant to Mr. H. B. Ivers, general manager and purchasing agent of the company.

Mr. W. H. Munro has been appointed manager of the Peterborough (Ont.) Radial Railway to succeed Mr. J. H. Larmonth, who has been appointed manager of the Peterborough Light & Power Company, Peterborough, Ont.

Mr. William H. Savery has resigned as superintendent of the Westfield division of the Springfield (Mass.) Street Railway. Mr. Savery entered electric railway work nine years ago with the Woronoco Street Railway. He was formerly connected with the Boston & Albany Railroad.

Mr. Charles W. Ford has resigned as general superintendent of the Oklahoma Railway, Oklahoma City, Okla. Mr. Ford has been connected with the company since 1902. His associates in the company surprised Mr. Ford recently by presenting him with a gold watch as a token of their esteem.

OBITUARY.

James A. Collins, who was secretary of the Cincinnati (Ohio) Street Railway for 20 years, died at the Jewish Hospital, Cincinnati, Ohio, recently, from injuries received on Nov. 7, 1910, when he was struck by an Avondale car in Cincinnati. Mr. Collins was born at Williamstown, Ky., on Feb. 20, 1847, and entered the service of the Cincinnati Street Railway in 1873 as auditor. Later he was made secretary of the company. He also served as claim agent of the company for several years. He was a thirty-third degree Mason and for 27 years had been secretary of all Scottish Rite bodies in Cincinnati. Mr. Collins was also a member of the Cincinnati Business Men's Club, the Dayton Club, Dayton, Ohio, and the Hamilton Club, Hamilton, Ohio. He is survived by a widow and one son, Mr. Alpheus Collins, who is connected with the Cincinnati Traction Company.

The Public Service Commission has adopted a resolution providing for a hearing to be held by Commissioner Bassett, on Nov. 30, 1910, to consider the advisability of laying out a rapid transit route in Nostrand Avenue, Brooklyn, as a subway from Eastern Parkway South to Flatbush Avenue, and from that point south to the vicinity of Sheepshead Bay as an elevated railway. On Sept. 16 the commission approved a report of Commissioner Bassett favoring the building of a rapid transit route in Nostrand Avenue, the cost to be defrayed by assessment on the owners of the property to be benefited. Property owners have petitioned the Public Service Commission to extend the subway from its present terminus at Van Cortlandt Park to the Yonkers city line. It has been announced that the Interborough Rapid Transit Company is preparing a new subway proposal which will be submitted to the commission shortly. Up to noon on Nov. 22, 1910, the commission had not replied to the communication of the Hudson & Manhattan Railroad, referred to on page 1071 of this issue.

Construction News

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

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

RECENT INCORPORATIONS.

***Grandview Street Railway, Birmingham, Ala.**—Application for a charter has been made in Alabama by this company to build a 4-mile street railway in Birmingham. Capital stock, subscribed, \$100,000. Incorporators: E. W. Jordan, C. J. Phillips and W. M. Kane.

***Denverside Connecting Railway, East St. Louis, Ill.**—Application for a charter has been made in Illinois by this company to build an electric railway in East St. Louis. Capital stock, \$100,000. Incorporators: George G. Heller, Robert Gillespie, A. W. Baltz, Robert P. Munger and Harry S. Kramer.

***Pekin & Petersburg Interurban Railway, Pekin, Ill.**—Application for a charter has been made in Illinois by this company to build an electric railway to connect Pekin and St. Petersburg. It is expected to extend this line southeast throughout Tazewell County, connecting Hopewell, Minier and other towns. Capital stock, \$50,000. Directors: W. A. Elliott, New York; A. C. Sprague, Du Bois, Ill.; E. C. Todd, J. A. Shellito and William Ressler, St. Paul, Minn.

***Toledo & Indiana Railroad, Toledo, Ohio.**—Incorporated in Ohio to build an electric railway through Lucas, Fulton, Williams, Henry, Defiance and Paulding Counties. Capital stock, \$10,000. Incorporators: George D. Welles, Frank W. Caughlin, Eugene Winkworth, Henry W. Isenberg and Frank E. Miller.

Moose Jaw (Sask.) Electric Railway, Ltd.—Application has been made in Saskatchewan for a charter by this company to build a 7-mile electric railway in Moose Jaw. It is also expected to acquire and to construct suburban lines leading from Moose Jaw. Capital stock, \$400,000. Officers: A. A. Dion, 35 Spark Street, Ottawa, president; Newton J. Ker, vice-president; Douglas R. Street, secretary and treasurer. [E. R. J., Sept. 3, '10.]

FRANCHISES

***Birmingham, Ala.**—The Grandview Street Railway has asked the Board of Revenue of Jefferson County for permission to build over county roads in Jefferson County. The company proposes to build a 4-mile electric railway in Birmingham and Jefferson County. E. W. Jordan, C. J. Phillips and W. W. Kane are interested as incorporators, as noted elsewhere in this department.

Fresno, Cal.—S. N. Griffith, Fresno, will apply to the Council for a franchise for a railway over certain streets in Fresno. This proposed railway will connect Fresno and Clovis. [E. R. J., Nov. 19, '10.]

Long Beach, Cal.—The Pacific Electric Railway has received a franchise from the Council to extend its tracks on Riverside Drive near Sixth Street in Long Beach to connect the Union Oil Company's plant with the main line.

Springfield, Mass.—The Springfield Street Railway has asked the Railroad Commission for authority to extend its tracks in West Springfield on North Main Street in Springfield.

Ballston Spa, N. Y.—The Schenectady Railway has received permission from the Trustees to build an extension through Ballston Spa. This will be part of an extension to connect Albany and Ballston Spa via Schenectady. At Ballston Spa it will connect with the Hudson Valley Railroad.

Edgewood, N. Y.—The City & Elm Grove Railroad has asked the Council for an extension of time on its franchise to build an electric railway in Edgewood.

Dalton, Pa.—The Berkshire Street Railway has asked the Railroad Commission for approval of location of its tracks on Hinsdale Road in Dalton and the relocation of tracks on the state highway in Cheshire; also for the extension of time for maintenance of the grade crossing over the Boston & Albany Railroad over Park Street in Adams.

Lewisburg, Pa.—The Lewisburg, Milton & Watsonville Passenger Railway, Milton, has received permission to use the tracks of the Lewisburg & Tyrone Railroad and the Pennsylvania Railroad in the borough. This gives the company the right of way to enter Lewisburg.

Seattle, Wash.—The Seattle Electric Company has applied to the Council for a franchise to build a double-track extension to its line across the proposed Stone Avenue Bridge, extending from Westlake Avenue across Lake Union to Kilbourne Street in Seattle.

Tacoma, Wash.—The Tacoma Railway & Power Company has received a franchise from the Council to build a line on North Thirty-fourth Street, between Madison Street and Stevens Street, in Tacoma.

TRACK AND ROADWAY

Alabama Traction Company, Montgomery, Ala.—This company is surveying its proposed 25-mile railway in Montgomery. It is expected to begin work soon. Charles G. Abercrombie, Montgomery, general manager. [E. R. J., Nov. 12, '10.]

Alabama Railway & Electric Company, Opelika, Ala.—This company will build a 3½-mile extension from Birmingham to Mine No. 13 during the coming year. Roger W. Snyder is interested. [E. R. J., Dec. 19, '08.]

Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.—This company has filed for record a mortgage in favor of the Carnegie Trust Company, New York, as trustee, to secure an issue of \$1,250,000 of 5 per cent bonds, dated Oct. 1, 1910. This company is planning to build a line from Fresno to Kingston and Sanger.

Central California Traction Company, San Francisco, Cal.—This company has completed all the details for the rebuilding of its lines in Stockton. The material has been ordered. The foundation will be changed from the usual rock ballast to concrete and the ties will be set into the solid concrete.

Denver (Col.) Interurban Railroad.—This company expects to extend its electric service from Denver to Boulder, Longmont, Loveland, Fort Collins and Greeley.

Georgia Railway & Electric Company, Atlanta, Ga.—This company is making plans to extend its railway from Decatur to Stone Mountain via Scottdale and Ingleside.

Iowa Traction Company, Oskaloosa, Ia.—This company has completed surveys and secured most of the right of way for its proposed railway. Construction is to begin within the next 60 days. The line will connect Oskaloosa, Barnes City, Montezuma, Malcom and Tama. Capital stock authorized, \$2,000,000. Bonds authorized, \$3,000,000. Bonds issued, \$500,000. The company will operate 10 cars. Its repair shops will be located at Oskaloosa. Officers: George E. Wodehouse, P. O. Box 423, Oskaloosa, president and general manager; C. M. Hiserman, Albia, vice-president; Earnest J. Renz, Albia, secretary, and G. W. Gordon, treasurer. [E. R. J., Nov. 5, '10.]

Illinois Traction System, Champaign, Ill.—This company will build an extension to Joliet.

Decatur, Sullivan & Mattoon Transit Company, Mattoon, Ill.—This company has decided to begin the construction of its proposed 48-mile electric railway early in the spring. [E. R. J., Jan. 22, '10.]

Sterling-Moline Traction Company, Sterling, Ill.—It is said that this company has completed all preliminary arrangement and will begin construction in the Spring on its proposed electric railway to connect Sterling, Morrison, Lynedon, Prophetstown, Erie, Hillsdale and Moline. The Milwaukee Construction & Engineering Company are said to be interested in this proposition. A. Van Petten, Sterling, general manager. [E. R. J., Aug. 27, '10.]

Kalamazoo, Elkhart & South Bend Traction Company, South Bend, Ind.—This company has been voted a \$3,500 subsidy by Washington township in aid of the proposed 50-mile electric railway to connect South Bend and Kalamazoo via Mishawaka, Elkhart, Bristol, Constantine, Nottville, Three Rivers, Parksville, Vicksburg and Austin. A. D. Harris, South Bend, president. [E. R. J., Nov. 19, '10.]

Louisville, Lincoln Farm & Mammoth Cave Traction Company, Glasgow, Ky.—Press reports state that this com-

pany has completed preliminary arrangements and will now let contracts for building its proposed 47-mile electric railway to connect Glasgow and Hodgenville, via Canmer, Hardyville and Buffalo, including a bridge over the Green River. J. M. Richardson, Glasgow, president. [E. R. J., July 30, '10.]

***Lafourche Valley & Gulf Railway, Donaldsonville, La.**—This company has been organized to build an electric railway on the west bank of Bayou Lafourche between Lockport and Donaldsonville. Capital stock, \$1,500,000. Officers: F. M. Welch, president; J. N. Colomb, vice-president; Monroe Dugas, second vice-president, and Charles Maurin, treasurer. Headquarters, Donaldsonville.

Holyoke (Mass.) Street Railway—This company has completed and will soon place in operation its double-track line on High Street and Appleton Street in Holyoke.

***Detroit, Bay City & Northwestern, Caro, Mich.**—This company is being organized to build an electric railway to connect Detroit, Utica, Romeo, Almont, Imlay City, Burnside, North Branch, Mayville, Caro and Bay City. From Burnside a branch will be built to Marlette, Bad Axe and Harbor Beach.

Granite City Railway, St. Cloud, Minn.—This company expects to build a 1-mile extension of its tracks in Granite City. All material is on hand.

Kansas & Missouri Railway, Kansas City, Mo.—This company will begin work in the spring on its 37-mile electric railway to connect Fort Scott, Arcadia, Coldwater, Grass, Mulberry, Fuller, Nelson, Curranville, Frontenac and Pittsburg. Officers: Col. L. H. Phillips, 610 Broadway, Kansas City, president; G. H. Dorman, vice-president, and C. E. Cary, Ft. Scott, secretary. [E. R. J., Nov. 12, '10.]

Billings (Mont.) Traction Company.—It is said that this company has secured the capital necessary for the construction of its proposed electric railway in Billings. John A. Connolly is interested. [E. R. J., Nov. 5, '10.]

Auburn & Syracuse Electric Railroad, Syracuse, N. Y.—The Public Service Commission, Second District, has approved the franchise granted by Auburn to this company as to the construction and extension of certain tracks and switches in Auburn. The commission has also approved the franchise granted by Auburn to the Auburn & Northern Railroad for the relocation of its tracks in State Street, Auburn.

Asheville (N. C.) Electric Company.—This company has awarded to B. J. Luther & Company, the contract to build a short extension to West Asheville. The extension has been surveyed and the remaining contracts for the work will soon be let. Work will be begun at once.

Cincinnati (Ohio) Traction Company.—This company, will extend its Glendale line to Hamilton, and an hourly schedule will be maintained between Glendale and Hamilton. The tracks of the Millcreek Valley Traction Company will be used from the end of the city limits.

Columbus, New Albany & Johnstown Traction Company, Columbus, Ohio.—This company reports that within the next 60 days it will complete arrangements for building an extension to its tracks, and if the negotiations now pending are successful definite information will soon be made public.

Columbus, Mt. Vernon & Mansfield Railway, Columbus, Ohio.—This company has completed surveys for its proposed electric railway to connect Columbus and Mansfield via Mt. Vernon. L. P. Stevens, general manager. [E. R. J., July 30, '10.]

Defiance (Ohio) Interurban Railway.—This company advises it is a preliminary organization only, and when its reorganization is accomplished will, with larger capital, construct and operate this proposed electric railway to connect Defiance, Ohio, and Ft. Wayne, Ind., via Ashwood, Emmett, Cecil, Paulding, Antwerp and New Haven. Capital stock, \$50,000. Officers: K. V. Haymaker, Defiance, president; Chas. E. Bennett, Wauseon, vice-president; T. C. Jacks, Defiance, secretary; Robert G. Holgate, treasurer; T. C. Jacks, Defiance, general manager, and The W. H. Schott Company, 39 Jackson Boulevard, Chicago, Ill., engineers. [E. R. J., Nov. 19, '10.]

Oklahoma Union Traction Company, Tulsa, Okla.—This

company has awarded the Interurban Construction Company the contract to build a railway from Tulsa to Sapulpa via West Tulsa and Redford. This work will include the building of a bridge over the Arkansas River at Tulsa. It is expected to begin construction at once.

***Ottawa & Kingston Electric Railway, Ottawa, Ont.**—Preliminary steps are being taken to organize this company to build an electric railway from Ottawa to Kingston and Smith's Falls, via City View, Manotick, Kars, Burritt's Rapids and Merrickville. Application will soon be made for a charter. Among the directors are Robert McElroy, Carp; C. L. Dickenson, Manotick; Thomas Kidd, Burritt's Falls; F. A. Heney, Westboro; Geo. Boyce, J. C. Graham, A. E. Baker, J. E. Caldwell, D'Arcy Clayton and D. Clark.

Allegheny & Northwestern Railroad, Philadelphia, Pa.—This company has completed surveys and is asking bids for the construction of part of its proposed 21-mile electric railway to connect Callery, Mars, Valencia, Bakerstown and Deer Creek, connecting with the Allegheny Valley Railway Company at Harmarville. At Evans City the line will connect with the Pittsburg, Harmony, Butler & New Castle Railway and at Mars with the Pittsburg & Butler Railway and the proposed Rochester & Mars Street Railway. Work will be begun at the Evans City end. The bonds have been taken by a Philadelphia syndicate. All the franchise rights are said to have been obtained. [E. R. J., Dec. 19, '08.]

Pottstown & Reading Street Railway, Pottstown, Pa.—This company advises that during the next 6 weeks it will let contracts for building a 5-mile extension of its tracks and also for building 4 new iron bridges. C. Taylor Leland, 2215 Land Title Building, Philadelphia, secretary.

Greenville, Spartanburg & Anderson Railway, Anderson, S. C.—This company is making surveys for an extension of its railway from Greenville to Mount Holley, via Gastonia and Kings Mountain.

***Bristol, Tenn.**—Surveys have been made to build a proposed electric railway from Bristol to Kingsport, a distance of 26 miles.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—This company contemplates building an 8-mile extension of its tracks from its present terminal in Chattanooga to the top of Lookout Mountain.

Houston (Tex.) Electric Company.—This company is building an extension of several miles to its Fanning Street line in Houston.

Kenosha (Wis.) Electric Railway.—This company plans to extend its tracks from Middle Street, Kenosha, to Washington Island. This work would require the rebuilding of a bridge at a cost of about \$10,000.

Badger Railway & Light Company, Milwaukee, Wis.—This company advises that it will begin construction Mar. 1, 1911, on its proposed 21-mile railway to connect Whitewater, Elkhorn and Lake Geneva. Capital stock authorized, \$10,000. Headquarters, 711 Majestic Building, Milwaukee, Wis. Repair shops will be located at Whitewater and the company will furnish power for lighting purposes. Officers: H. B. Kamschutte, Milwaukee, president and chief engineer; Victor Lachmund, vice-president, and Gustav Pickhardt, Milwaukee, secretary. [E. R. J., Sept. 3, '10.]

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company is planning extensive improvements in its terminal building in Los Angeles.

Southern Pacific Railroad, Los Angeles, Cal.—This company will begin work on its railway station at Sixteenth Street, Oakland, early in January. All of the suburban electric trains are to be handled through the second floor of the depot and will approach it on elevated tracks. The depot will be 278 ft. long and will provide a main waiting-room with news stands, telephone and telegraph stations, checkrooms and other features. At the north end there will be a baggage-room and express offices, transfer stations and cab and automobile stands. On the second floor there will be a waiting-room for suburban passengers. The offices of the depot attachés and officials of the company will also be located on the second floor.

Central California Traction Company, Sacramento, Cal.—This company has awarded the contract to Keating & Bradford Company for building stations along its line. Work on the freight station and waterfront terminal facilities to be erected at Front Street and X Street in Sacramento will begin shortly. The cost of constructing the station is estimated to be about \$7,500.

Denver (Col.) Tramway Terminal Company.—This company will build a railway station in Arapahoe Street, Denver. The waiting-room will be 25 ft. x 70 ft., and the walls and ceiling will be finished in dark oak. The officials of the company will occupy eight rooms on the second floor. The roof of the structure will be of tile and steel sheds will cover concrete platforms from which passengers enter the cars.

Alton, Jacksonville & Peoria Railway, Alton, Ill.—This company is building a new car house and repair shops at Alton. All material has been ordered.

Springfield (Mo.) Traction Company.—This company expects to build a new car house in Springfield the early part of 1911 and has ordered special track layout from William Wharton, Jr., & Company, Philadelphia, Pa.

Dayton, Covington & Piqua Traction Company, West Milton, Ohio.—This company advises that it has built a new freight house at Pleasant Hill and is now building an extension, 60 ft. x 25 ft., to its freight house in Piqua.

Oklahoma (Okla.) Railway.—It is said that this company has arranged with the Oklahoma Electric Terminal Company for the construction of three one-story buildings. The structures are to be 55 ft. x 112 ft., 57 ft. x 95 ft., and 55 ft. x 95 ft. The company will also erect two-story-and-base-ment waiting-room and trainmen's quarters 44 ft. x 55 ft. and train sheds 60 ft. x 106 ft. The buildings will be of reinforced concrete faced with red vitrified brick and steel trim. The cost is estimated to be about \$500,000. The contract is let to the Selden-Breck Construction Company, Fullerton Building, St. Louis, Mo.

Portland Railway, Light & Power Company, Portland, Ore.—This company expects to build a two-story frame stock house at the foot of East Lincoln Street, Portland. It is estimated by the company that the building will cost about \$10,000.

POWER HOUSES AND SUBSTATIONS

San Diego (Cal.) Electric Railway.—This company has placed an order with the Westinghouse Electric & Manufacturing Company, Pittsburgh, for two 1000-kw, 600-volt, 514-r.p.m. generators to be driven by Westinghouse-Parsons low-pressure steam turbines running at 3000 r.p.m. The generators and turbines will be connected through Melville-McAlpine reduction gears. In addition to this equipment the Westinghouse company will shortly ship one 1200-kw, 600-volt, 80-r.p.m. engine type d. c. generator to this company.

Western Railway & Light Company, Champaign, Ill.—This company is preparing to begin the construction of its new hydro-electric power plant at Marseilles. The cost is estimated to be about \$300,000.

Alton, Jacksonville & Peoria Railway, Jerseyville, Ill.—This company reports that it is now building a new power house at Alton. All orders have been placed.

Lexington & Interurban Railways, Lexington, Ky.—This company has begun the preliminary work for the extension of its power plant in Lexington. It has just purchased from the Babcock & Wilcox Company a 500-hp boiler and from Henry R. Worthington two feed-water boiler pumps. I. L. Oppenheimer, general manager. [E. R. J., Nov. 19, '10.]

Sarnia (Ont.) Street Railway.—This company advises that during the next two months it expects to purchase a new 350-kw generator. H. W. Mills, Sarnia, general manager.

Citizens' Railway, Waco, Tex.—This company, through the National Light & Improvement Company, Pierce Building, St. Louis, is asking bids on various additional equipment, including a 1500-kw steam turbine, with equivalent condensing capacity. Judson H. Boughton, St. Louis, secretary.

Manufactures & Supplies

ROLLING STOCK

Warren & Jamestown Street Railway, Warren, Pa., expects to purchase four new city and interurban cars.

Sanford (Fla.) Traction Company has ordered two storage battery cars from the Federal Storage Battery Company.

Mason City & Clear Lake Railway, Mason City, Ia., expects to purchase two double-truck pay-as-you-enter city cars.

Birmingham Railway, Light & Power Company, Birmingham, Ala., is building 23 double-truck car bodies in its own shops.

Pottstown & Reading Street Railway, Philadelphia, Pa., is considering the purchase of several motors and trucks of various sizes, either new or second-hand.

Oklahoma (Okla.) Railway has purchased from the Westinghouse Electric & Manufacturing Company four quadruple 101-B motor equipments with K-28 controllers.

Citizens' Railway, Waco, Tex., is receiving bids, through the National Light & Improvement Company, St. Louis, Mo., for several semi-convertible cars. Judson H. Boughton, St. Louis, secretary.

Boston (Mass.) Elevated Railway, noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 19 as having ordered 50 semi-convertible cars from the Laconia Car Company, will equip these cars for pay-within operation. They will be 48 ft. 2½ in. long, 8 ft. 8¾ in. wide and 12 ft. high.

TRADE NOTES

Ackley Brake Company, New York, N. Y., has shipped an order of 50 Ackley brakes to Yokohama, Japan.

Chicago Fuse Wire & Manufacturing Company, Chicago, Ill., has moved its offices into its new building at 1014-1022 West Congress Street, Chicago.

United States Electric Signal Company, West Newton, Mass., has received an additional order from the Public Service Railway, Newark, N. J., for 50 blocks of type "G" signals.

Universal Safety Tread Company, Boston, Mass., reports the Universal safety tread is to be installed on the steps of the 50 cars recently ordered by the Boston Elevated Railway from the Laconia Car Company.

De Laval Steam Turbine Company, Trenton, N. J., announces that the Dravo-Doyle Company, which heretofore has represented it in Pittsburgh, Philadelphia and Cleveland, will open an office in Chicago at the Marquette Building in charge of H. S. Budd.

W. J. Fauth, formerly treasurer of the W. K. Kenly Company, Chicago, has severed his connection with that company and has opened an office at 310 Monadnock Building, Chicago. Mr. Fauth will represent manufacturers of track and signal supplies.

W. F. Goltra Tie Company, Cleveland, Ohio, has been organized to manufacture and deal in cross ties. The officers are: W. F. Goltra, president and general manager; L. C. Mambourg, vice-president, and P. J. Gallagher, secretary and treasurer. Headquarters are at 804 Rockefeller Building, Cleveland.

Dossert & Company, New York, N. Y., have arranged through their Canadian representative, Irving Smith, of Montreal, for the Northern Electric & Manufacturing Company, Limited, to act as sales agent for the Dossert solderless connectors through its branches at Toronto, Winnipeg, Regina, Calgary and Vancouver.

Edgar Allen American Manganese Steel Company, Chicago, Ill., has appointed Walter Brinton consulting engineer, with headquarters at its plant in New Castle, Del. Mr. Brinton was formerly superintendent of the manganese steel department of the Taylor Iron & Steel Company's plant at High Bridge, N. J., from which position he has just resigned.

American Brake Shoe & Foundry Company, New York, N. Y., has elected William G. Pearce vice-president, effective Jan. 1, 1911. Mr. Pearce will have headquarters in

New York. It is stated that Mr. Pearce will retain his financial interest in the Griffin Wheel Company, of which he was formerly vice-president and general manager, and will continue as a member of its board of directors.

Western Electric Company, New York, N. Y., has received an order from the Central Vermont Railroad for telephone equipment for dispatching trains on its northern division from St. Albans to Windsor, Vt., 150 miles. Among other New England roads which are using the telephone for dispatching trains are the New York, New Haven & Hartford Railroad, Boston & Maine Railroad and the Boston & Albany Railroad.

Curtis Motor Truck Company, Decatur, Ill., will furnish Curtis all-forged non-galloping single trucks, type CS-58-96, for the 31 cars which are being built for the Illinois Traction System by the Danville Car Company. The Curtis Motor Truck Company has also delivered to the Illinois Traction System 16 heavy trucks for interurban service. Four pairs of these go under express cars and four pairs under combination express cars.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has leased the 8-story building at 429 First Avenue, Pittsburgh, for a term of years and will move its north-side warehouse to the new location, the north-side quarters being too small to meet the demand of increasing business. A repair department will also be established in the First Avenue building, which work has heretofore been sent to East Pittsburgh.

Ohio Brass Company, Mansfield, Ohio, will furnish to the New York, New Haven & Hartford Railroad, for the Hoosac tunnel electrification, a large number of strain insulators, with a mechanical strength of 35,000 lb. each. The insulators have an electrical dry flash-over value of 170,000 volts, and a wet flash-over value of about 100,000 volts. The railroad company has also purchased several hundred suspension insulators of special design to prevent possible grounding. These suspension insulators also have a high flash-over value.

Wagner Electric Manufacturing Company, St. Louis, Mo., has appointed L. G. Bassett sales representative for the western part of New York, with headquarters in Buffalo. Mr. Bassett has for some time been the manager of the apparatus department of McCarthy Brothers & Ford, who have represented the Wagner Company in this territory. McCarthy Brothers & Ford will continue their representation of the Wagner Company in the Counties of Erie and Niagara and Mr. Bassett will make his office in their building, 41-43 East Eagle Street.

Galena Signal Oil Company, Franklin, Pa., has elected Samuel Addison Megeath president and general manager to succeed General Charles Miller, who becomes chairman of the board, succeeding J. C. Sibley, resigned because of ill health. Mr. Megeath became connected with the Galena Signal Oil Company in 1895, and in January, 1909, he was elected vice-president and general manager. L. J. Drake, second vice-president, has been elected first vice-president, succeeding Mr. Megeath, and C. C. Steinbrenner has been elected second vice-president, succeeding Mr. Drake.

The Noiseless Typewriter Company, Middletown, Conn., and New York City, has recently completed the development of a noiseless typewriter which is now being put on the market. The special feature of this machine is that the typing is done by a pressure stroke instead of a blow. Hence the machine is practically noiseless and has a low maintenance cost. Less force is required to operate it and it gives a clearer impression than the ordinary machine. Moreover, the number of legible carbon copies which can be made by it is greatly multiplied. The president of the company is W. Caryl Ely, of Buffalo.

ADVERTISING LITERATURE

Dearborn Drug & Chemical Works, Chicago, Ill., have issued a booklet describing Dearborn boiler preparations for use in connection with the treatment of boiler feed waters.

Locke Insulator Manufacturing Company, Victor, N. Y., has issued a booklet entitled "Power Giants," discussing the merits of Victor insulators and briefly describing some of their installations.

Precision Instrument Company, Detroit, Mich., has issued

catalog D, which explains the principles upon which its Simmance-Abady patent automatic combustion recorders are based and also describes their construction in detail.

Joseph Dixon Crucible Company, Jersey City, N. J., has issued a 40-page booklet entitled "Graphite Products for the Railroads." It covers the Dixon line of products widely used in railroad service. These include the various graphite lubricants, protective paint, crucibles, facings, etc.

National Electric Lamp Association, Cleveland, Ohio, has issued a bulletin describing the engineering and scientific activities of the association. Illustrations are shown of the various departments where this work is carried on. The National Electric Lamp Association began the work of research and development in 1903 with six employees and at present employs 200 trained men. Its work costs approximately half a million dollars a year to carry on.

NEW PUBLICATIONS

The History of the Telephone. By Herbert N. Casson. A. C. McClurg & Company, Chicago, 1910; 315 pages, with index. Price, \$1.50 net.

This book is a résumé of the history of the Bell telephone system treated from a popular rather than from a technical standpoint.

World Corporation. By King C. Gillette. The New England News Company, Boston, Mass., 1910; 240 pages. Price, \$1.

Mr. Gillette's idea is to displace the present economic system in part competitive and in part monopolistic by one co-operatively owned organization termed by him "World Corporation." The latter has already received an Arizona charter, in which the scheme of proposed action is set forth in detail.

The Railway Library, 1909. Compiled by Slason Thompson, Bureau of Railway News and Statistics, Chicago, 1910; 403 pages, with index. Price, 75 cents.

This work is a compilation of a number of interesting articles and statistics on steam railroad matters published during 1909 by the Bureau of Railway News and Statistics. Among subjects of interest to electric railways are those on "Railway Mail Pay," "Diminishing Purchasing Power of Railway Earnings" and "Employees and Their Compensation."

Dynamo-Electric Machinery — Direct-Current Machines, Eighth Edition. By Samuel Sheldon and Erich Hausmann. D. Van Nostrand Company, New York, 1910; 328 pages, including index. Price, \$2.50 net.

This book needs little further recommendation than to state that it is now in its eighth edition. The latest imprint contains much new matter, such as a set of problems at the end of each chapter; a discussion of the theory of commutation; means for predetermining the operating characteristics of d.c. motors and generators; discussions on storage batteries, balancers and boosters, and a treatise on costs, prices and operating expenses of machines and plants. The method of presentation is adapted for students who are reasonably familiar with simple equations.

Electric Trains. By H. M. Hobart. D. Van Nostrand Company, New York, 1910; 201 pages, including index. Price, \$2.50 net.

Mr. Hobart is not only a recognized authority in the realm of heavy electric traction, but he is also an engineer who has the ability to explain his methods in clear English. A large part of his latest book is devoted to simple practical methods of calculating the energy requirements of electric cars. Another important feature is the system of obtaining approximate costs of electric rolling stock. Mr. Hobart has introduced a novelty in his calculations by using the meter for short lengths, while retaining the mile for long ones. To avoid misunderstandings regarding short and long tons he has treated the British (2240 lb.) and the metric (2204 lb.) ton as identical, so that the kilogram is designated as the thousandth part of either ton. The excellent typographical and pictorial details of the work show the great care taken to make the salient points stand out with due prominence. Most of Mr. Hobart's data are derived from English underground railway and electrified steam railroad practice, but, of course, this does not invalidate his work for the American reader.