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One Way to Fix a Piece-Work Rate

It is the common experience of shop managements that the substitution of the piece-work system for day wages has the twofold merit of lowering the cost of production and raising the earnings of the men in proportion to their skill. Nevertheless, it is not easy to determine in advance a satisfactory rate for the possible increased output when the shops are to be handled on an incentive basis. One master mechanic solved this problem in a very effective manner. He wanted to place car-window cleaning on the piece-work system, but was in doubt as to what would be a fair unit price. He therefore undertook the task of cleaning car windows himself, so that after an experiment lasting a little over a week he had ascertained just how much time an industrious and fairly skilful man would need to clean a certain number of car windows. With this knowledge it was a simple matter for him to fix a rate which would prove mutually beneficial to the men and the company. The very fact that the employees had seen their chief trying out the new scheme in person prevented the dissatisfaction which probably would have been experienced had the rate been chosen arbitrarily or based on the work of some exceptionally fast man

Newspaper Criticisms

It is an interesting commentary upon newspaper criticism that all of the Milwaukee journals published on the day following the announcement of the resignation of Mr. Beggs as president of the Milwaukee Electric Railway & Light Company spoke in the highest terms editorially of his ability as an organizer and operator and of the service which his company is now rendering the city. This must be very gratifying to Mr. Beggs, because some of these same papers have been very antagonistic to him during his 14-year administration in Milwaukee; but the incident has a broader significance than that which concerns the Milwaukee situation. Public service corporations in other cities are constantly the subject of newspaper attacks. Some of these criticisms may be just and some may not, but in very few cases are they based upon any very exact knowledge of the actual conditions. But public service corporations, like public officials, afford a shining mark, and general charges against their motives or their efficiency give an impression among the uninformed of a constant zeal in the public welfare. In some respects the public service corporation is even more exposed to attack than the public official because of its impersonal and continuous corporate character. It is unpracticable at this time and in this place to print some of the past newspaper criticisms in Milwaukee and in a parallel column the tributes of last week, but such an exhibit would be instructive. It would encourage the officials of other public

service corporations which are doing their best to serve the communities in which their properties are located, and would make them realize that the criticisms directed against them are not really so severe or so sincere as they might otherwise think.

Movable Storage Bins and Shelves

It is remarkable how little thought is given in the planning of storerooms toward the attainment of some degree of elasticity in the arrangement of shelves and partitions. The customary fittings are of wood and usually they are nailed so hard and fast that adjustments for changed conditions can be made only at considerable expense for labor and material. In one storeroom recently erected many of the bins proved so small when the material was to be distributed that they were really worse than useless. For example, the bins for the controller spindles were just large enough to obtain a skin-tight fit. The consequence was that rather than use these small bins the storekeeper preferred to keep a lot of supplies on the floor, with little semblance of order. Trouble of this sort would be avoided if the shelves had movable partitions so that the width of the bins could be altered at pleasure and if the shelf brackets were designed to permit their insertion at any desired intervals on the wall beams. Preferably such an installation should consist of iron brackets and sheet-metal fittings, but the same principle can easily be applied to wooden construction. Flexible shelving has long proved very advantageous in bookcases and there is no reason why it should not be equally desirable in storerooms. It might cost a little more than the ordinary rigid system, but its superior convenience would be worth the extra outlay.

Accurate Judgment of Running Speeds

It is common for witnesses in electric railway accident litigation to testify that the car under discussion was moving at a "high," "moderate" or "low" rate of speed as the case may be. But when subjected to the strong light of a shrewd lawyer's questions these nebulous terms evaporate to such a degree that little of such testimony can be resolved into material evidence. Of course it is perfectly natural that a layman should have only a hazy notion as to how fast a car is traveling. Certainly he cannot tell whether it is or is not going faster than the local ordinances permit. Reasonably exact judgment, however, should be expected from the motormen who travel over the same route many times a day. If the motorman concerned in an accident could swear that his car with the controller on a given notch could not exceed, say, 20 m.p.h. over a certain section, his demonstrable assertion would surely outweigh the intangible guesses of any number of inimical witnesses. It is therefore very desirable that the car operators should know the running speeds in addition to the schedule speeds. The man who is taught the physical characteristics of the route over which he operates and the speed possibilities which they safely permit is likely to become a more careful operator in every way. Something has already been done toward educating motormen in this respect on lines where sharp curves, inclines, crossings, etc., demand the operation of cars at specified lower speeds, but such instructions should be carried out with greater scientific exactness than is now the fashion. There is no valid reason why a motorman should not be as familiar with his equipment as the steam locomotive engineer who knows exactly what can be done to make up time between any two points on his run.

FINANCIAL CHANGES IN PHILADELPHIA

Stockholders of the Philadelphia Rapid Transit Company have voted formally to approve broad plans which have for their purpose the financial reconstruction of the company. These plans are given in detail elsewhere in this issue and include the approval of a new system of accounting, an increase in the bonded debt, and the transfer of the equity and lease in the Market Street Elevated Passenger Railway to an underlying company, by which the elevated road is again leased to the parent corporation. Through a reaudit the balance sheet of the company shows a surplus, as of Dec. 31, 1910, of \$607,100, although the last official report, covering the fiscal year ended June 30, 1910, showed an accumulated deficit on that date of \$1,118,609.

Reference may be made here to the statement of the principles upon which the public accountants acted in making their reaudit of the accounts, although the details of the entries in the profit and loss account which produced this great change are published in full in another part of this issue. The process by which deficit gave way to surplus involved a complete audit of the accounts for the entire period of existence of the company: that is to say, from July 1, 1902, to Dec. 31, 1910. In brief, the readjustment involves the inclusion of all expenses of organization in the property account, the adoption of a policy of amortizing the items of bond commission and losses due to the strike of 1909, and the treatment as capital expenditures of all charges made to bring the plant taken over by the operating company "to a normal operating condition." The theory on which the last-named principle is based is presumably that the charges of this nature, although probably made in whole or in part for the betterment of underlying properties, are capital expenditures of the new corporation.

Without discussion of the statement of principles advanced by the accountants as the basis for their changes it may be shown that through the readjustment thereby effected the total amount of \$2,842,405, previously charged to profit and loss directly or to operating expenses, is made available. Other adjustments go to swell the amount which finally provides in the reconstructed profit and loss account as of Dec. 31, 1910, not only the surplus mentioned, but also a reserve for accrued accident claims of \$1,250,000.

Of the principal items in the condensed balance sheet as of Dec. 31, 1910, in which the new surplus is incorporated, those to which attention should be drawn are the reserve of \$1,433,603 for accident claims and that of \$1,500,000 for accrued renewals. No discussion regarding the reserve for renewals appears in the report of the accountants, but presumably it has been provided in accordance with conditions named by E. T. Stotesbury in connection with his entrance into the affairs of the company. The largest item in the balance sheet is that of leases, franchise, construction, equipment, advances to leased lines, sinking fund, etc., a total of \$99,107,715. Of this amount \$577,820 is carried as "franchise account" and is stated to represent the "cost of organization and expenses incident thereto." Leases, etc., amount to \$12,673,006, and this item is stated to represent the value of equities acquired by the company under its leases not heretofore appearing on the books of the company. The value of leases "covered by bonded indebtedness" is placed at \$10,853,761 and a value of \$1,500,000 is set upon the lease of the Market Street Elevated Passenger Railway.

Statements of the total number of passengers carried and earnings and expenses for the six months ended Dec. 31, 1910, are given. It appears from these figures that the net increase in passenger receipts in that period, as compared with the corresponding period of the previous year, was 4 per cent. In the number of passengers carried the increase was 5.2 per cent. Of the total revenue of \$10,279,031 from passenger and chartered-car traffic there was required for operating expenses \$5,346,426, or 52 per cent. For maintenance of power plant there was expended \$740,344, or 7.2 per cent of the total revenue. The expenditure for maintenance of way and buildings was \$475,103, or 4.6 per cent of the revenue. The outlay for maintenance of equipment was \$530,316, or 5.2 per cent. Thus the aggregate maintenance expenditures reached a total of 17 per cent of the income from operation as stated in the report. Transportation expenses were 25.2 per cent and general expenses 9.8 per cent. The operating revenues from other sources were equal to \$286,972, and the company also derived a return of \$159,898 from the dividends on stocks owned. After provision for taxes and interest a net profit on operations for six months was left of \$200,745. This result is an improvement over the outcome of operations for the fiscal years from 1907 to 1910, inclusive, in each of which a deficit was shown.

THE PEAK LOAD

An interesting recent development in the subject of central station work is the use of direct-connected gasoline engine sets for the purpose of helping over the peak load. Of course, since the beginning of central station practice the peak has been the manager's pet abomination, and almost every possible scheme for supplying extra power economically has been at one time or another tried out. Many large lighting stations, like many railway plants, have, in a measure, met the difficulty by the installation of storage batteries. Looking at this device from the standpoint of economical power supply, it is fairly evident that, counting in the losses in the battery and the cost of upkeep and depreciation, the actual cost per kw-hour delivered via the batteries is considerably higher than the cost per unit delivered straight from the generators. Obviously, therefore, schemes like the auxiliary generating set have a reasonable excuse for existence and the question is merely as to what form of auxiliary power is, on the whole, most economical and available, particularly for railway plants. The devices most generally recommended, aside from the storage battery, are gas engines and superheated water storage in connection with either special turbines or turbines worked at high pressure during the peak. To these should be added the oil and the gasoline engines, which are in effect really varieties of the gas engine.

The peak load falls both upon the generator plant and the boiler plant, so that both need the relief which is furnished by any one of the plans noted. In railway practice, however, the peak in amount and character differs considerably from the peak found in the ordinary lighting station, and it does not by any means follow that the remedial measures which apply well to the latter are equally well suited to the former. The peak of a railway load begins a little later and continues considerably longer than the ordinary lighting peak. It is due in general to the rapid homeward movement of passengers immediately after the close of business hours, at which time the lighting load is beginning to fall off. The railway peak also endures longer, since the time of transit homeward of the

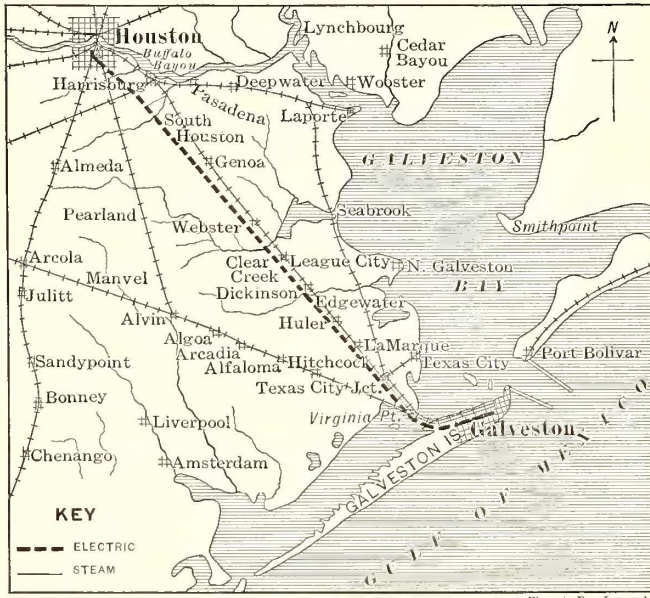
moving crowd is on the whole much longer than the time that elapses between the coming of darkness and the close of business hours.

A railway power station, therefore, must furnish peak power for a longer period than a lighting station, and hence cannot afford to take such large chances with the efficiency of power generation. It cannot put overload on its machine quite so safely, nor can it store power in batteries to quite so good advantage. A still more radical difference between railway and lighting practice is with respect to the wandering of the load. In electric lighting this wandering is a familiar phenomenon, but it does not take place so conspicuously during the peak as at the period when the peak is rapidly falling. The lights in the business district, upon the whole, go out before the residential element of the peak has reached anything like its maximum, so that while the center of load shifts noticeably the extreme peak which causes trouble is produced by a fairly definite territory. In railway practice the load which actually produces the evening peak is a far more wandering load, which shifts and spreads out over a considerable territory. It, therefore, is less desirable in railway work to meet the peak by added installation at the main generating station than in the case of a lighting plant. If batteries are installed, they should be where they will do the most good to the shifting load, and if auxiliary gas, oil or gasoline engines are employed, they can most advantageously be placed in a similar independent situation. The storage of power by superheated water is, therefore, less applicable to railway plants than in general distribution.

As regards plants driven by explosion engines, the choice between one kind and another is merely a question of cost and convenience. Producer gas plants have been used with fair results in several instances. The employment of oil and gasoline engines in a similar way is comparatively new in this country. The engine using comparatively heavy oils has a very considerable advantage in cost of fuel, but has to be of a somewhat different character from other explosion engines. Gasoline is a more expensive fuel used in a more familiar type of engine. Any form of engine using petroleum has, in the matter of convenience, a great advantage over the engine using producer gas, in that it takes considerably less space and attention and is a much less objectionable neighbor than a producer plant, particularly if the latter is to be equipped, as it for convenience should be, with a gas holder. There are electric railway systems on which gas or oil-driven auxiliaries might be used to considerable advantage. We should like to see a careful analysis of costs as between such auxiliaries and batteries similarly located and supplied with power from a central station. We should judge the economic question between these to be rather close, closer than it would be in electric lighting distributions, and it certainly is not a question that can be settled off-hand. In analyzing the economic aspects of the question, much would depend on the actual character of the peak load, both with respect to time and place. It will be found, we think, that in not a few cases the simplest solution of the peak difficulty is the installation of one or more steam-driven auxiliary stations able at once to supply peak power and to deliver it conveniently at points well suited to meet the wandering load. Difficulties due to this wandering and to exaggerated peaks are most severely felt in single stations which supply power over a somewhat too wide area of distribution.

THE GALVESTON-HOUSTON INTERURBAN RAILWAY

One of the latest additions to the transportation facilities of Southern Texas is the Galveston & Houston Interurban Railway, which is rapidly approaching completion under the designer and builder, the Stone & Webster Engineering Corporation, of Boston, Mass. Galveston has a population of about 40,000, and is the principal port on the Gulf of Mexico, being second only to New York in the value of its yearly exports. Included



Galveston-Houston Railway—Route of Electric Lines and Steam Railroads Centering at Houston

among its shipping facilities are 220 miles of steam railroad terminal trackage, 5 miles of docks and 95 acres of warehouses. From Galveston three steamship lines are in service to Liverpool, three to New York and one each to Bremen, Cuba, Vera Cruz and Tampico. Houston, 45 miles northwest, has a population of about 90,000. It is the greatest cotton market in the world, the center of the oil and lumber regions of the State, and is served by 18 railroad connections.

GENERAL FEATURES

The new line is to be of single-track construction, with a right-of-way permitting a second track eventually. Its total

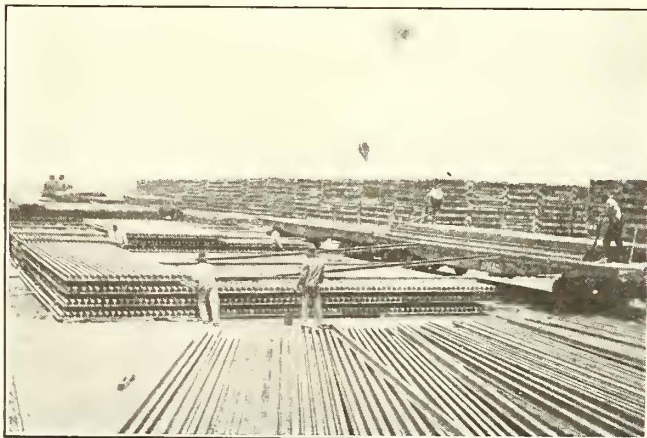
the supply of power from a central plant to substations with motor-generator sets to supply direct current to the rolling stock, and the use of a type of interurban car which has substantially become a standard for the interurban service of the Stone & Webster organization.

ROUTE AND TRACK

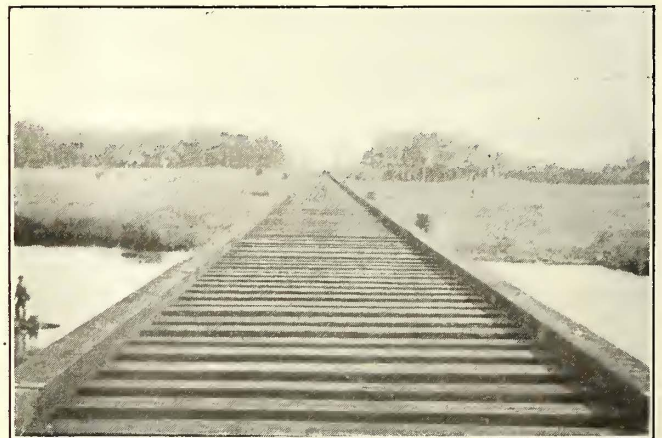
Beginning at a point on the southerly side of Houston the line follows a southeasterly direction, traversing Harris and Galveston Counties to the westerly municipal limits of Galveston. The territory is practically all open prairie, as there are only 2 miles of clearing on the entire route. There are but six curves on the interurban section, none of which exceed 2.1 deg. For 36 miles the line runs at a tangent. The maximum grade of 3 per cent occurs on a viaduct built over the Santa Fé tracks outside the Houston city limits. With this exception the maximum grade on the entire line will be 0.5 per cent. The interurban section follows a private right-of-way throughout, the width of the latter being about 100 ft. The poles carrying the transmission, feeder, trolley and telephone circuits are being set in the middle of the right-of-way, so that they will occupy a space between the double tracks when the latter are installed.

Outside the Houston city limits a reinforced concrete trestle 2000 ft. long is built over the steam railroad tracks. In entering Galveston, which is located on an island, the railway will occupy a portion of the new Galveston causeway, now nearing completion. This causeway has a total length of 10,642 ft., and will cost \$1,500,000. It will connect the mainland with Galveston Island, and will be used jointly by Galveston County, five steam railroads and the interurban line. The causeway is a combination of earth-filled approaches, from the mainland and the island ends, and a reinforced-concrete arch viaduct with a steel lift bridge at the center. The length of the filled portion of the causeway is 8184 ft.; of the concrete viaduct, 2358 ft., and of the lift bridge, 100 ft. On the filled portion of the causeway there is sufficient room for a double-track interurban line, but only a single track can be maintained on the concrete viaduct and Scherzer 100-ft. clear span steel lift bridge.

The interurban track will consist of 80-lb T-rail laid on 6-in. x 8-in. x 8-ft. cypress ties, spaced 2 ft. centers in gravel or shell ballast. Six-bolt Bonzano rail joints will be used, together with welded bonds of No. 0000 copper, supplied by the Electric Railway Improvement Company, of Cleveland, Ohio. About 100,000 cypress ties are used. The company is also experimenting with 20,000 hard pine ties, seasoned and dipped in carbolineum, and with 10,000 creosoted ties. The roadbed is nearly



Galveston-Houston Line—Stacking Steel in the Material Yard



Galveston-Houston Line—Decking on Bridge Across Clear Creek

trackage covers 45.45 miles, consisting of a main line of 44.23 miles; five passing tracks with a total length of 1 mile, and three substation sidings, 0.22 mile long. The inclusion of short connections inside the limits of the terminal cities brings the total of trolley on the line to 50.5 miles. The overhead work is of catenary construction. Other distinguishing engineering features of the road are an unusual absence of grades and curves,

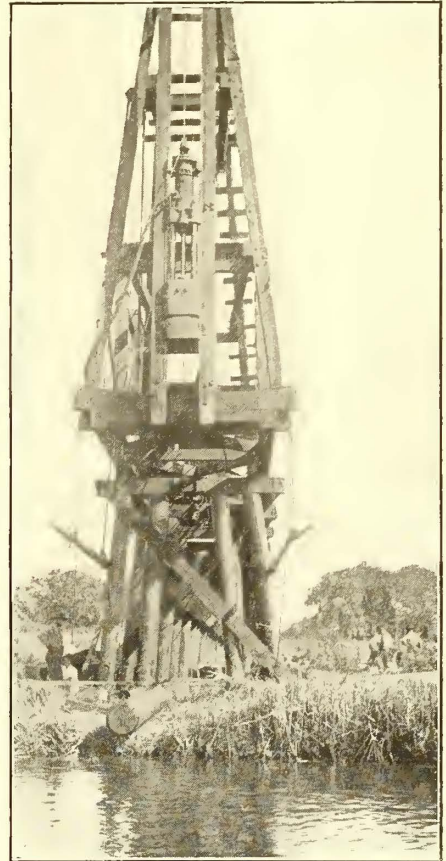
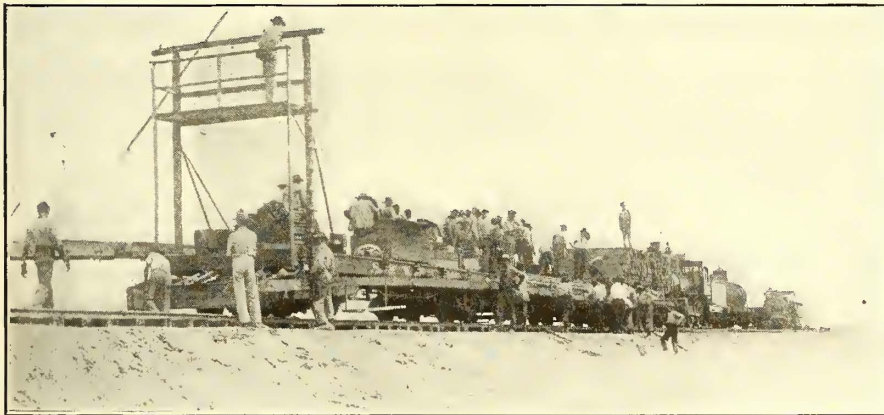
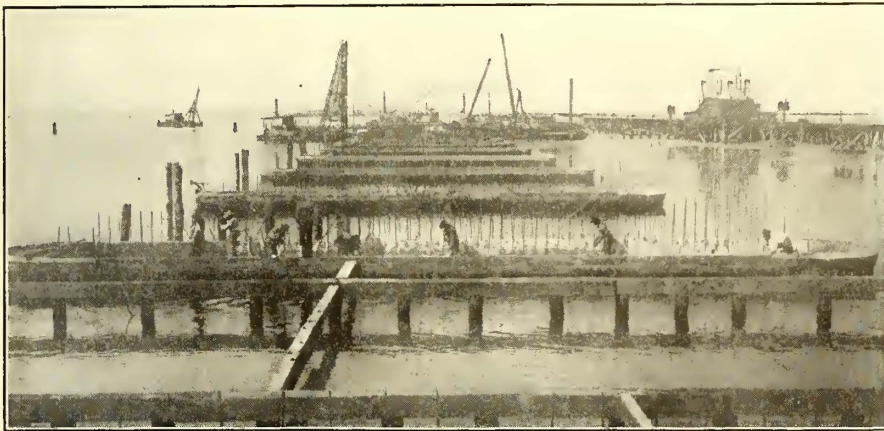
all embankment work, 18 ft. wide at the top. The cuts are very few and light. There will be about 27 open-deck pile trestles on the line, crossing creeks, bayous and natural drainage ways. These will vary in length from 24 ft. to 700 ft. Culverts of cypress timber are to be provided at various points to insure good drainage. The minimum depth of ballast below the bottom of the tie is to be 6 in., and the ballast is to be crowned

to shed water throughout the entire line. Cattle guards are to be installed at all road crossings, and the entire right-of-way will be fenced in, except where the line crosses highways.

CATENARY TROLLEY AND OTHER CIRCUITS

Direct current for car operation will be supplied by a single catenary trolley of No. 0000 B. & S. section, carried on three-fourths of the line by a 7/16-in. steel messenger cable. About 10 miles of the line near the Galveston end are equipped with a 3/8-in. copper-clad steel messenger cable. The trolley is carried 19 ft. above the top of the rail. The brackets which carry the insulators supporting the messenger cable are of T-iron construction, and are 9 ft. in length. The trolley is carried about 7 ft. 6 in. from the side of the pole, but this distance is adjustable by the use of a clamped base which supports the messenger insulator. The trolley is hung 23 in. below the messenger cable, to which it is connected by hangers spaced 15 ft. The brackets are attached to the poles by sockets at their bases and by 5/8-in. tie rods which run diagonally into the pole above the level of the messenger insulator. Anchor-

Current is transmitted from Webster to substations at a potential of 33,000 volts, there being a three-phase circuit of No. 2 copper carried in a right triangle of 48-in. spacing on the sides. The line is transposed every 3.5 miles, the details of the pole and cross-arm arrangement being practically the same as in the regular pole installation, except for the provision of two insulators on the bottom arm of the high-tension service and the omission of one insulator on the top arm. The insulators were supplied by the Ohio Brass Company. The insulators are carried 7.5 in. above the cross-arms on 2-in. iron pipe pins, 12 1/2 in. long over all. The insulator is cemented into the upper part of the pin, the lower portion of the pin being bolted through the cross-arm and set into a 2-in. hole in the latter. About 1700 poles are required for the interurban section. Each pole is equipped with a lightning protective top, consisting of a 2-in. galvanized iron pipe, 90 in. long, with a flat top, 18 in. long. A 5/16-in. galvanized iron cable is attached to the shoulder between the round and the flat portion of the protector and run from pole to pole above the transmission line. There is a clear-



Galveston-Houston Line—Views Taken During Construction of the Line

ages are provided with wood break-strain insulators, in addition to the usual clamps, thimbles, turnbuckles, anchors, hangers and clips. The messenger cable is supported 10 in. above the bracket. The poles, which are spaced 150 ft., are of creosoted pine, 40 ft. long, with 8-in. tops and 18-in. butts. They are set in the earth 8 ft. below the top of the rail.

About 10 in. above the bracket a 7-ft. cross-arm is placed for telephone and feeder circuits, the former being carried on one side of the pole and the latter on the other. At present a 650,000-circ. mil bare copper feeder is installed throughout the entire interurban section between city limits. Within the limits of Galveston the cars will be handled on the tracks of the Galveston Electric Company and in Houston on the lines of the Houston Electric Company, both of which are Stone & Webster properties. The high-tension service of the road is carried on three-piece cemented porcelain insulators mounted on two 5-ft. cross-arms near the top of the pole. The upper arm is carried 9 in. below the top of the pole, and the lower arm is 4 ft. below the upper, or 6 ft. 4 in. above the feeder arm.

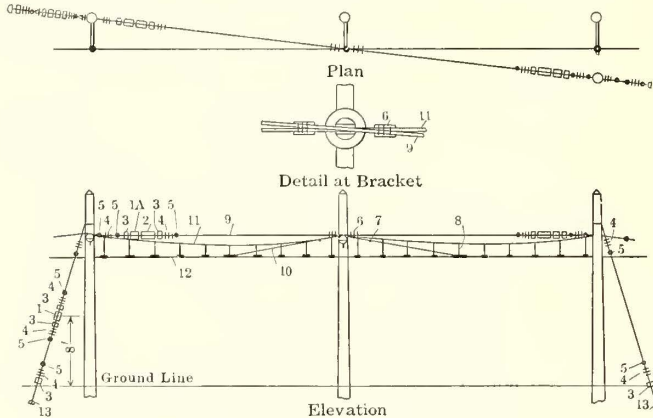
ance of about 4 ft. between the guard wire and the nearest wire of the high-tension service. Electrolytic lightning arresters are installed in the line outside the power house and at each substation.

POWER PLANT

The power house at Webster will contain an initial installation of three 600-hp B. & W. water-tube boilers and two 1500-kw, 2300-volt, 60-cycle G. E. three-phase alternators, each direct-driven by a horizontal Curtis turbine. The power house is a brick and steel building about 70 ft. x 100 ft. in dimensions, on concrete foundations. An ample supply of water for condensing is provided from a nearby stream. An emergency supply of water is obtained from a 650-ft. artesian well, which is equipped with an air lift. This well provides water for a 50,000-gal. overhead tank, from which water is drawn for boiler feed make-up and for emergency fire protection. The normal supply of condensing water from the creek is drawn through two service tunnels carried beneath the turbine room. A central discharge tunnel for heated circulating water is

carried out of the station beneath the turbine room in the direction opposite from that of the entering circulation.

The steel stack is 10 ft. in diameter and 177 ft. high above the boiler room floor. When another stack opposite the present one has been built and the boilers served by these

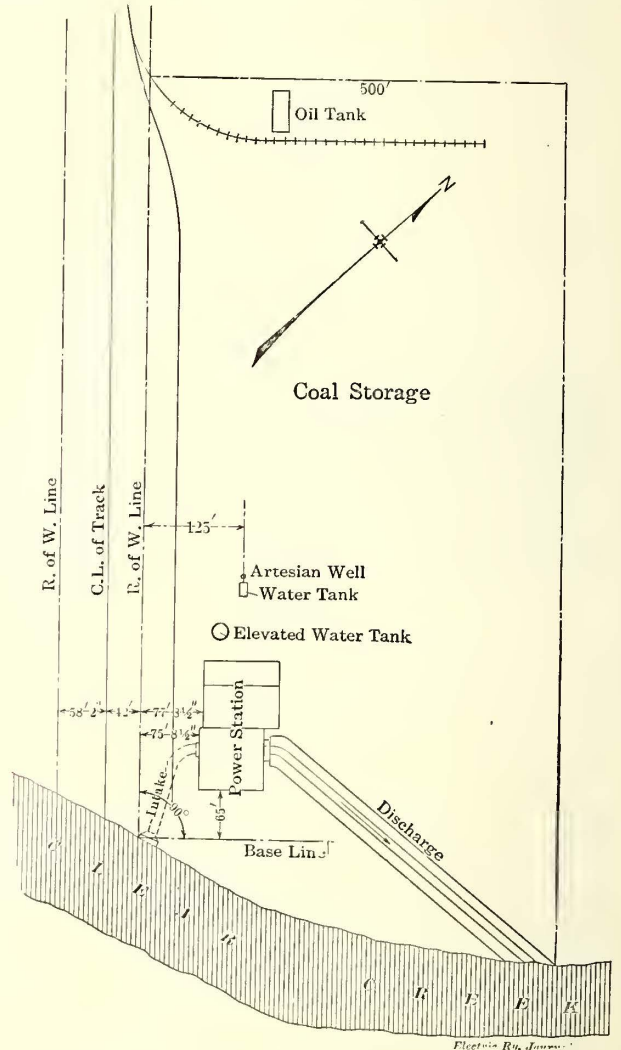


Bill of Material		
Item No.	Quantity	Article
1	1	Wood Break Strain Insulators 19"
1A	2	Wood Break Strain Insulators 19" "Clevis"
2	2	3/4" x 12" Galvanized Turnbuckles
3	8	3/8" Steel Wire Strand Thimbles
4	10	3" Bolt Guy Wire Clamps
5	12	3/8" Crosby Clips Galvanized
6	2	Messenger Anchor Clamps Type C A
7	2	3/8" Crosby Clips Galvanized
8	2	Trolley Anchor Hangers
9	325'	3/4" Galvanized Steel Strand
10	70'	3/8" Galvanized Steel Strand
11		Messenger Cable
12		Trolley Wire
13	2	Guy Anchors

Electric Ry. Journal

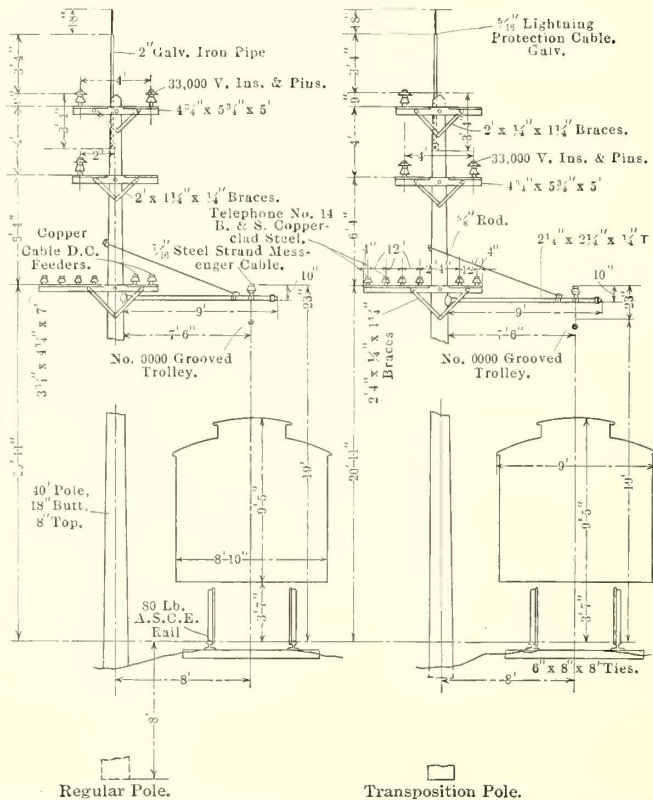
Galveston-Houston Railway—Line Anchor of Catenary Trolley Line

raising the steam temperature 125 deg. Fahr. The operating steam pressure will be about 185 lb. The stack is to be lined for about half its height with brick. An open heater under the stack will handle the turbine condensation and the make-up water. A water-weighing device will be installed to facilitate checking the turbine and boiler performances. The condensing equipment is of Alberger manufacture, and consists of two counter-current surface condensers of 5000 sq. ft. of cooling surface each, two 8-in. x 20-in. x 12 in. dry vacuum pumps, two circulating pumps of 4000 gal. per minute capacity each, direct-connected to a 7-in. x 8-in. Sturtevant engine in each case, and a 2-in. hot-well, centrifugal pump, driven by a 12-in., two-stage, 2000-r.p.m. turbine. The condensers are installed between the turbines for convenience in operation. The hot-



Electric Ry. Journal

Galveston-Houston Railway—Lot Plan of Power Station and Vicinity



Electric Ry. Journal

Galveston-Houston Railway—Line and Track Construction with Car Clearances

stacks have been installed one unit of the ultimate boiler plant may be considered complete, and this unit may be repeated as many times as may be necessary.

Each boiler is equipped with a superheater capable of

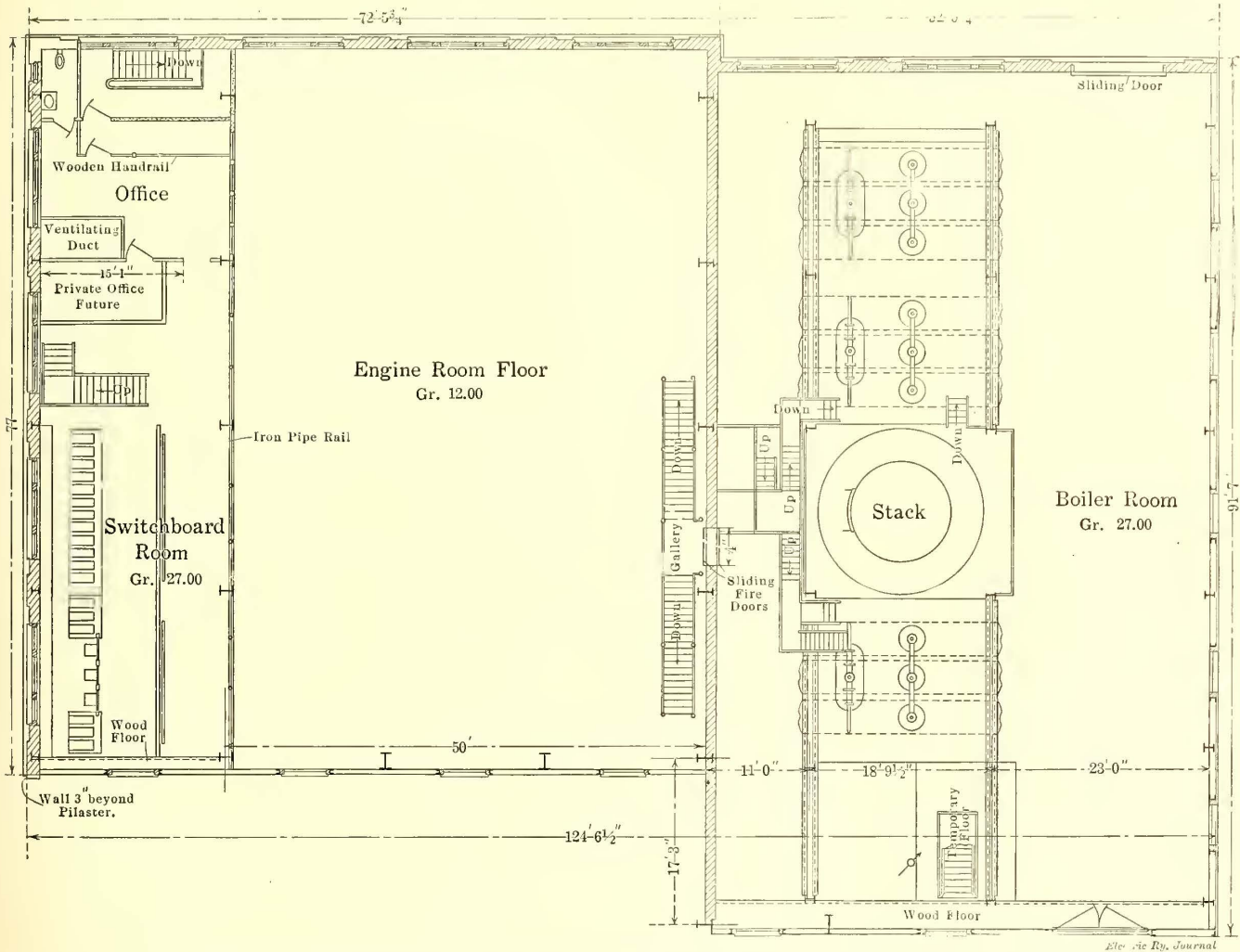
well pump is placed to receive the benefits of a gravity delivery of the turbine condensation.

FUEL AND AUXILIARIES

The plant is designed for either oil or coal, although the former fuel will be used for the present. Arrangements have been made to deliver oil by gravity from tank cars to concrete tanks, whence it can be drawn into the boiler room. About two weeks' supply can be stored in each tank planned, and duplicate suction lines are to be installed. The station has been designed with no basement below the turbine floor, the boiler room floor being about 15 ft. higher than the turbine room floor. An oil-pumping equipment, heater, air chamber, strainers, etc., will be installed under the stack space. Provision is made in the design of the station framing for coal pockets above the boilers. All auxiliaries are either in the turbine room or close to it, none being in the boiler room. The oil pump

installation will maintain a constant supply pressure with reducing valve and damper regulating control installation to govern the supply of oil and the draft in accordance with the steam pressure. The oil is taken by the fuel pumps which are in a fireproof room below the stack and passed through an exhaust heater in the same compartment. The heater is provided with a drip pocket, so that any water that separates from the oil after heating may be seen and drawn off readily. A large air chamber is also provided so that the pressure in the oil lines does not fluctuate. The steam and oil at constant pressure are delivered to a balanced valve controlled by a damper regulator. Each boiler has its individual damper. The oil supply to the burners of the furnaces and the steam for atomizing the oil are thus controlled automatically with the load. Space has

The main operating switchboard is located on a gallery at the side of the turbine room and 15 ft. above the floor of the latter, to give the operator a clear view of the machinery. For the same reason a chief engineer's office has been located on the gallery. Above this is the high-tension switch room containing the high-potential oil switches and selectors connected with the 33,000-volt busbars. Either turbine can be run on either 2300-volt bus. There are three exciters in the Webster station, two being steam-driven and one motor-driven. The main switchboard on the operating gallery contains 10 panels; three are for exciter service, two for alternators, two for outgoing lines, one for transformer and one each for station lighting and power and substation feeder service. The transformers are located beneath the main switchboard in a bay off the turbine



Galveston-Houston Railway—Floor Plan and Grade Levels of Webster Power Station

been provided for two future coal conveyors in case oil is superseded by coal. In this connection an ash-handling system, with gravity delivery from hoppers into cars on a narrow-gage track, can readily be provided. The turbine room is served by a 25-ton Case electrically operated crane of 48 ft. 5 1/2 in. span.

ELECTRICAL FEATURES

The output of the turbo-alternators passes through 2300-volt oil switches to one of two sets of busbars via selector knife switches which permit the units to be operated on the same or separate buses as desired. Three 500-kw, 2300/33,000-volt, water-cooled, oil-insulated transformers are installed in the station, and connected with each set of 2300-volt busbars through oil and selector switches. The high-tension side of the transformers is connected directly to the 33,000-volt bus through connecting switches. There is a single 33,000-volt bus, with provision for future duplication. Two 33,000-volt lines are taken out of the station and each is protected by an automatic oil switch.

room. General Electric electrolytic lightning arresters are installed out of doors beside the station.

LABOR

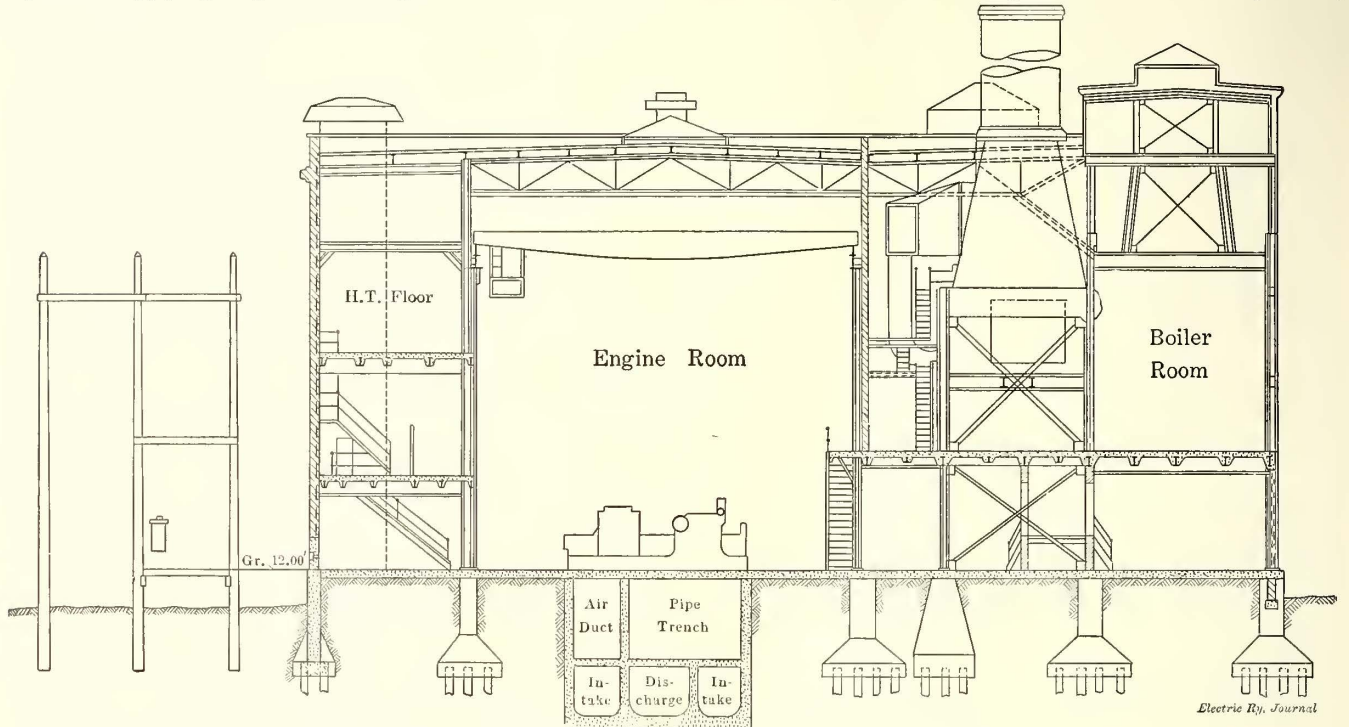
The station has been specially designed to secure a low labor cost in its operation. Three points tending to insure this are the grouping of the auxiliaries in the turbine room, and all upon one floor; the use of an automatic fuel oil system, and the absence of numerous compartments in the arrangement of the station building. The cross duct under the station carries a few pipes and is used at present largely as a means of ventilation for the turbine room. It is carried to the outer walls of the building and terminates in a riser which discharges into the outer air at the roof level.

SUBSTATIONS

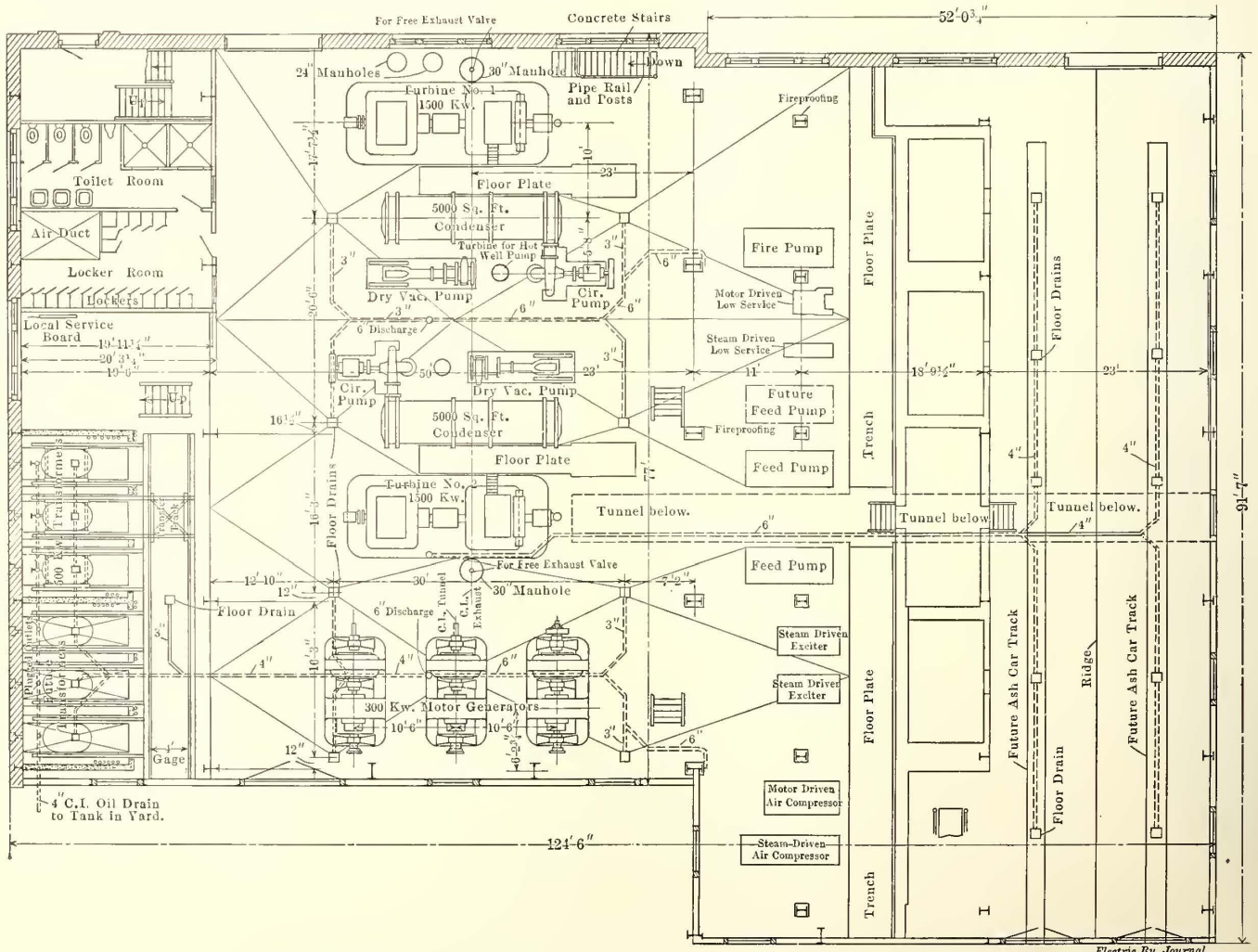
Substations are located in the Webster power house, and at South Houston, 14 miles north, and at LaMarque, 13.5 miles south of the plant. Each substation contains two 300-kw synchronous G. E. motor-generator sets, with transformers and

switching equipment for each installation. A spare 300-kw motor-generator has been temporarily set up in the Webster station and can be transferred to either substation if needed. A frequency of 60 cycles was adopted because the company expects to supply lighting service along the line at a later date.

The motors are operated at 2300 volts, and current is delivered to the feeder and trolley lines at 600 volts. At each substation a section insulator is provided in the trolley and the feeder line is cut in two to facilitate flexibility of operation in case of trouble on any section. The generators are flat-compounded,



Galveston-Houston Railway—Cross-Section of Power Station

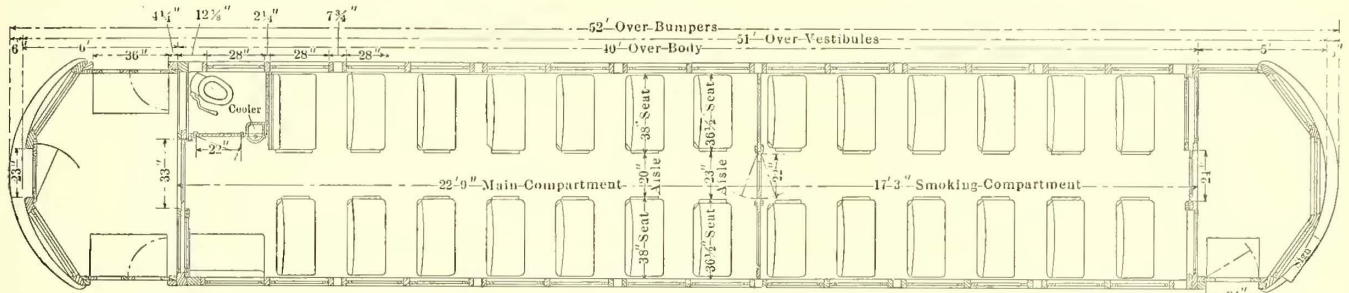


Galveston-Houston Railway—Basement Plan of Webster Power Station

and in the substations the exciters for the synchronous motors are mounted on the motor shafts.

An interesting feature of the Webster substation wiring is the use of a six-wire busbar connected with a compensator for starting the synchronous sets. In the other substations 33⅓ per cent taps are taken off the transformers and five-wire bus connections are provided, so that by the use of double-throw starting switches the motor-generators can be started without the use of compensators. The connections also provide for direct-current starting when desired. Three 250-kw oil-insulated transformers are provided for each substation, with the

24:51. The maximum speed is from 55 m.p.h. to 60 m.p.h. General Electric automatic relay type multiple unit control is provided, and the air-brake equipment is the Westinghouse type, "AMM." Each pair of motors is mounted on a Baldwin M.C.-B truck, with 6-ft. wheelbase and Symington ball-bearing center plates. Steel wheels, 37 in. in diameter, are used. The wheels have a 3-in. tread and a 7⁄8-in. flange depth, the flange thickness being 1⅓ in. The principal dimensions and other data of these cars are given in the following table. The express cars are operated for double-end operation, and are not included in these dimensions:



Galveston-Houston Railway—Plan of Standard Interurban Car

addition of a spare transformer for emergency service. The substations are of brick, and that at South Houston will be combined with a waiting room and baggage division.

STATION LIGHTING

The power station and substations are lighted throughout with tungsten lamps and holophane reflectors. The engine room is lighted by 100-watt tungsten lamps with concentrating reflectors which are suspended from the roof trusses about 50 ft. from the floor. They thus clear the crane and give an even distribution light without glare.

ROLLING STOCK

Ten motor passenger cars and two express cars have been

Length of car body over end panels at sills.....	40 ft.
Length of front platform over dashers.....	5 ft.
Length of rear platform over dashers.....	6 ft.
Length of car over bumpers.....	51 ft.
Extreme width, not to exceed.....	9 ft.
Height, under side of sills to top of monitor.....	9 ft. 5 in.
Height inside top of floor to under side head lining.....	8 ft. 6 in.
Height of window sills above floor.....	28 in.
Distance, center to center of windows.....	33 in.
Distance, top of rails to under side of sills.....	43 in.
Wheelbase of trucks.....	6 ft. 6 in.
Wheel diameters.....	37 in.
Width of tread.....	3 in.
Depth of flange.....	7⁄8 in.
Thickness of flange.....	1 3⁄8 in.
Seating capacity smoking compartment.....	24
Seating capacity coach proper.....	30

All the seats are of the stationary cross type except one rear seat for two opposite salons.

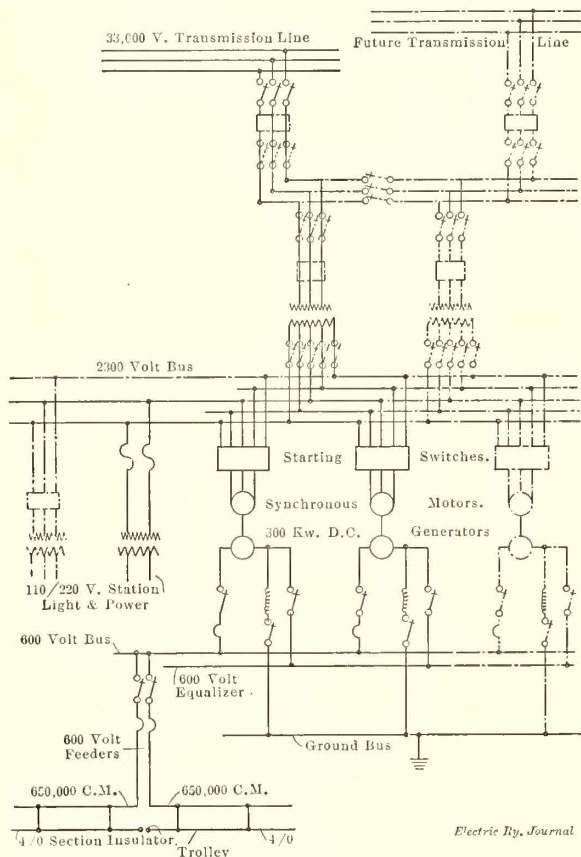


Galveston-Houston Railway—Concrete Causeway, View Taken During Construction

purchased from the Cincinnati Car Company. In general these cars closely resemble those in service on the lines of the Northern Texas Traction Company, between Dallas and Fort Worth, and on the Puget Sound lines of Stone & Webster. The cars are single-ended, with vestibules, and a smoking compartment is provided in front. The total seating capacity is 54, of which 24 passengers are carried in the smoking compartment. Each car is 52 ft. long over bumpers, and weighs complete about 36 tons, without passengers. The electrical equipment consists principally of four GE-73 motors, rated at 75 hp each, geared

The car has six longitudinal sills, running the entire length without splices. The two side sills are of 3½-in. x 7¾-in. long-leaf yellow pine, reinforced by 6-in., 13-lb. channels, the inside filler being 2¾-in. x 6-in. yellow pine. The two intermediate sills are of 4½-in. x 6-in. pine, reinforced by ¾-in. x 6-in. plate; the two center sills are of 6-in. I-beam construction, with 2¾-in. x 6-in. pine filler on each side. The cross framing is of 2-in. x 5-in. oak, tenoned into the side sill fillers, intermediate sills and center side sill fillers. The cross framing in contact with the plates is fastened by angle

irons. The end sills are of 5½-in. x 5-in. oak, reinforced on the inside by ¾-in. x 6-in. U-irons, bolted to the end sills and longitudinal timbers. The end sills are reinforced on their under sides with 4-in. x 6-in. x 5/8-in. angles, bolted to each section. There are two needle beams of 5-in. I-beam construction, bolted through the longitudinal timbers, I-beams and channel irons. The bolsters are of 1½-in. x 10-in. steel figured to support 75,000 lb. The bottom flooring is of 13/16-in. yellow pine, and the top flooring is of the same thickness of maple. Seven pairs of double Pullman style sash are provided on each side, with top, oval side sashes, cathedral glass. The posts



Galveston-Houston Railway—Substation Wiring Diagram

of the framing are of yellow pine, and the interior finish is of mahogany, with semi-empire ceilings and Agasote panels. Each car will have one Wagenhals arc headlight and bronze parcel racks, supplied by the Dayton Manufacturing Company, Dayton, Ohio.

SCHEDULES

The running time between the terminals of the line will be about 80 minutes, and the running time on the interurban section will be about 70 minutes. It is planned to operate the cars as a rule on an hourly headway, with occasional half-hourly service. Double-headers or multiple-unit trains will be operated for very heavy traffic. Two telephone systems are to be installed, one for dispatching and the second for general company business. It is anticipated that about seven stops will be made by cars on the interurban section. It is probable that some system of selective signaling will be installed at the stations.

The operation of the road will be under the supervision of L. C. Bradley, who is now manager in charge of the operation of the Galveston railway system. The cars will be maintained principally in Houston and stored at either end of the line, as occasion requires. It is expected that the line will be completed in the early summer of 1911. The estimated cost of the road is \$2,000,000.

The Savannah Electric Company has adopted olive green as the standard color for its cars.

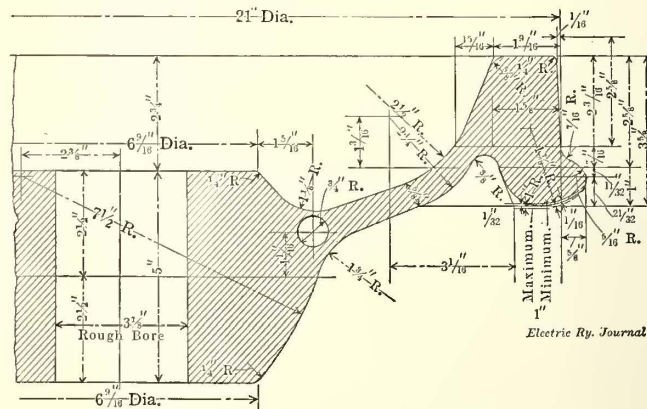
MEETING OF COMMITTEE ON POWER DISTRIBUTION

A meeting of the committee on power distribution of the Engineering Association was held at the association office in New York on March 8, 1911. Those present were: A. F. Hovey, Interborough Rapid Transit Company, chairman; Prof. A. S. Richey, Worcester (Mass.) Polytechnic Institute; E. J. Dunne, Public Service Railway; C. R. Harte, Connecticut Company; G. W. Palmer, Jr., Boston & Northern Street Railway; S. D. Sprong, J. G. White & Company.

The first subject discussed was the proposed specifications for overhead crossings of electric light and power lines which are being considered jointly by committees of the Engineering Association, National Electric Light Association and the American Railway Engineering & Maintenance of Way Association, together with representatives of the telephone companies and railway telegraph superintendents. These specifications were originally presented as an appendix to the report of the committee on power distribution at the 1910 Atlantic City convention. They have since been revised by a joint committee and in the revised form were considered at the meeting on March 8. Several modifications were suggested to meet the special conditions of crossings of low-tension feeder lines of electric railways. Farley Osgood, Public Service Electric Company, representing the National Electric Light Association, and R. D. Coombs, representing the Maintenance of Way Association, were present at the afternoon session to explain the reasons for the changes made in the original draft of the specifications. The modifications which seemed necessary to the members of the committee on power distribution will be referred back to the committee of the National Electric Light Association and the Maintenance of Way Association for final action before the specifications are presented to each of the associations for adoption.

STEEL PONY WHEELS IN BROOKLYN

The Brooklyn Rapid Transit System is now equipping its 2800 maximum traction trucks with Carnegie all-steel pony wheels of 21-in. diameter. Three thousand wheels have already been applied, 1200 are under order and several thousand more will be required to complete the work and allow for a reserve stock.



Brooklyn Solid Steel Pony Wheel

The original design of this wheel was shown on page 64 of the ELECTRIC RAILWAY JOURNAL for July 10, 1909, but the contour of the web was afterward altered when the order was placed with the mills. The present design is shown in the accompanying drawing.

The Bureau of Mines of the Department of the Interior has published, as Bulletin No. 4, a description of several modern gas-producer plants in Europe, prepared by R. H. Fernald, who was sent abroad to study European methods of utilizing low-grade fuels in the manufacture of producer gas. The pamphlet is illustrated with a number of drawings and half-tones.

NOTES ON THE LACKAWANNA AND WYOMING VALLEY RAILROAD

The Lackawanna & Wyoming Valley Railroad is notable as the first heavy electric and high-speed interurban railway constructed in the East. The system now comprises 23 miles of third-rail double track, connecting Wilkes-Barre, Pittston and Scranton. The operation of the line was begun May 16, 1903, by the contractor, but was formally taken over by the railroad company on Feb. 1, 1904, under Charles F. Conn., vice-president and general manager.

The business of the company has steadily increased from year to year, but, owing to the fact that there are three steam railroads between Scranton and Wilkes-Barre and two other electric railways in part of the territory between these cities, both the passenger and freight traffic are far below the available capacity of the line. The passenger earnings for the year ended June 30, 1910, were \$501,488.14, an increase of \$11,000 over the preceding fiscal year. An excess-baggage item of \$3,300 is not included in the foregoing total, although the company carries free 150 lb. of baggage per passenger. The electric railway charges 1½ cents per mile, or 30 cents for the 20 miles between Scranton and Wilkes-Barre, whereas the steam fare is 25 cents. On the other hand the electric service is much better, as limited trains are run every hour, in addition to a local service every 20 minutes. The company owns one

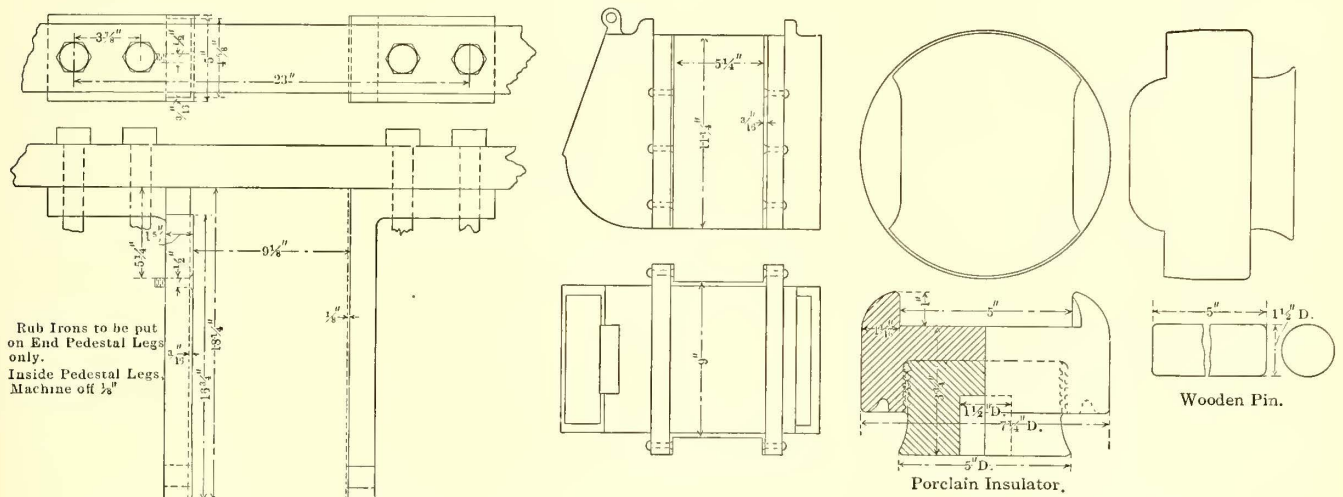
the haul is comparatively short, its pro rata necessarily is small.

THIRD-RAIL OPERATION

This road uses an exposed third rail, but has never had any maintenance charges on its account aside from insulator changes, bonding and jumpers at crossings. During the last two years the company began to replace the original insulators, and at this time some 6000 new ones have been installed. The new insulator, of which details are presented in the accompanying drawing, was invented by George W. Eslinger, the company's line foreman, and the patent is now owned by the Westinghouse Electric & Manufacturing Company. The body of the insulator consists of two pieces of porcelain cemented as shown and mounted on a wooden pin. The construction consequently has the merit of having no metal in any part. The insulators have been made by different potteries at a cost of 31½ cents each.

ROLLING STOCK CHANGES AND IMPROVEMENTS

The company began with 14 cars, but it now has 30 coaches in service, all motor cars. The original equipments, which were single-ended, have since been rebuilt for double-end operation and supplied with Westinghouse multiple-unit control. There are two 150-hp motors per car. The attractiveness of the cars for night service has been greatly enhanced by increasing the number of lamps from 18 to 36. All lights are 16 cp each. In view of the fact that there are tunnels and



Rub Irons for Journal Boxes and Pedestal Legs; Detail of Third-Rail Porcelain Insulator.

park and reaches two others on its lines, but the business from this source is not an important factor.

For the past four years the company has had a contract with the Adams Express Company for carrying express matter, most of which is through line traffic. For the year ended June 30, 1910, the revenue from this source was \$5,991.81, an increase of \$700 over the preceding fiscal year. The freight business for the latter period was \$60,000, an increase of \$8,000 over the year before. The local freight is not as large as one would expect, for, while there is a good deal of truck farming in this territory, many of the farmers still haul their produce to the nearest town, where they usually find ready customers without the intervention of commission men. Furthermore, there is little market freight movement or shopping traffic between the cities served. One man, whose headquarters are in Scranton, spends all of his time soliciting freight business. There is also a commercial agent in Wilkes-Barre who devotes three days a week to the same purpose.

The freight and express handling equipment consists of two electric locomotives, which can easily haul 15 standard freight cars; four motor cars, each of which can haul three loaded standard trailers if necessary; 10 box cars, 20 coal cars, two ballast cars and five gondola cars. The railroad interchanges freight with the connecting steam railroads, but, as

interrupted circuits at grade crossings, an auxiliary storage battery lamp circuit is provided.

F. J. Stevens, master mechanic of the company, has invented a method for throwing up automatically the pin of the old type Van Dorn couplers with which this company's cars are equipped. This object is accomplished by means of an auxiliary motorman's valve, whereby compressed air is led to a piston which is integral with the coupling pin. The operation of the piston therefore pushes the pin out of the coupling.

Mr. Stevens has also made an important improvement in journal boxes by furnishing them as well as the pedestals with wearing shoes or rub-irons, to prevent the excessive play of the brake rigging which had been caused by the wear of the pedestals and boxes. Instead of buying new boxes the old ones were planed and wearing shoes were riveted to them as shown in an engraving on this page. This engraving also shows the application of the shoes to a pedestal. As the brakes are inside-hung, the wearing shoes are put on the outer or end pedestal legs only. There is a bushed tie bolt in the bottom hole of the pedestal to hold the bottom, while the upper end is held by a ½-in. countersunk bolt which brings the head flush with the shoe. All wearing shoes are 3/16 in. thick. The first installation was made in the spring of 1909 and is still in use.

SHOP NOTES

Originally the company had considerable motor trouble from overheating. It was thought at first that the only remedy would be to replace the 150-hp motors by 200-hp motors. It has been found, however, that the difficulties with the motors are greatly reduced by giving the cars a lay-over period of 20 to 40 minutes every round trip. Another cause which has contributed greatly to increasing the reliability of the motor equipments has been the inauguration of commutator slotting combined with the use of high-grade brushes. The original hard brushes were not found suitable on slotted commutators, because they wore off the copper too rapidly.

Flash-over troubles have been cut down in the ratio of 1 to 25 and flatted commutators have been entirely eliminated. The first commutators were slotted $1/16$ in., but experience has shown that it is necessary only to cut to a depth which brings the mica just below the copper. This reduction in depth is due to the fact that the new brushes do not seem to wear the commutator at all. The brushes are of the Le Carbone and National types. Their average life is about 12,000 miles as compared with 600 miles from the old brushes. Commutators are slotted in 30 minutes to 45 minutes each by a Westinghouse pneumatic slotter which the operator holds in his hand while undercutting.

All of the wheels are of the steel-tired type, 36 in. in diameter for the motor axles and 33 in. in diameter for the trailer axles. These wheels have 10 spokes and cast-steel centers. The original motor wheels had nine spokes. These steel tires average four turnings and vary in life from 125,000 miles to 225,000 miles. All wheel work except the key-seating is done in the company's shops.

At first the company used two styles of brake shoes; one plain gray iron and the other the steel-back shoe with chilled ends made by the American Brake Shoe & Foundry Company. The steel-back shoe has now been made standard, as the gray-iron shoe wore out too fast. Another reason for giving up the softer shoe was that the iron dust thrown off sometimes was responsible for short circuits besides discoloring the sides of the car.

Hitherto the company has been inspecting and lubricating its equipments on the time basis, but it has now adopted a 900-mile period. Packing which is pulled out from journals is placed in one of the turbine type reclaiming machines made by the Oil & Waste Saving Machine Company. This machine is installed in the power house, where live steam is available for its operation. The oil thus reclaimed is filtered through excelsior and placed in a tank which is heated by steam coils and is so constructed that clean oil may be drawn off at one level, while water containing the sediment from the oil is tapped at another level and led directly to the sewer.

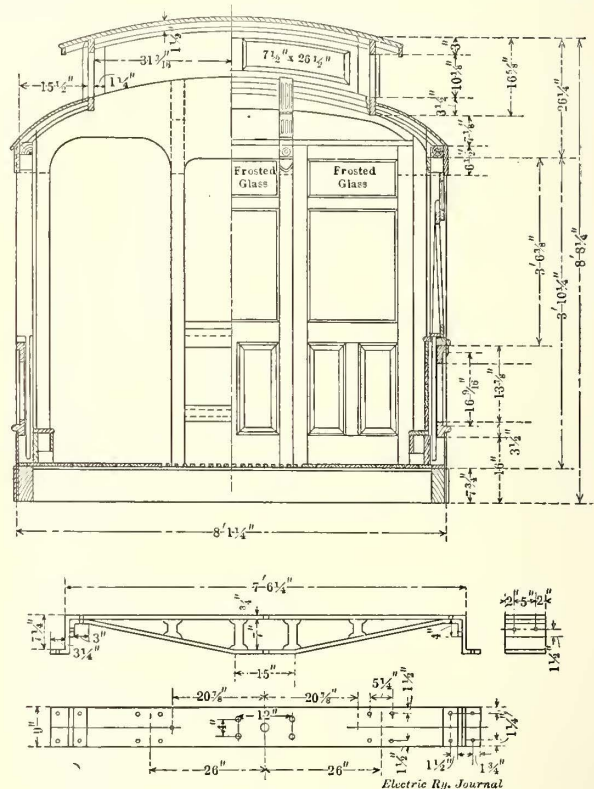
The shop is furnished with a pipe line which carries air at 50 lb. to 80 lb. pressure from six old railway motor compressors. The compressed air is used for various purposes. One application is for the commutator slotter. Another is for the brake-testing outfit which duplicates exactly the piping layout on a car, so that when equipment is tested all of the operating conditions with regard to length of piping, line pressure, etc., are faithfully imitated. A third application is in connection with the gas-pneumatic babbitt melters and soldering furnaces made by the American Gas Furnace Company. The combination of gas and compressed air is especially valuable for soldering work. It now requires only three hours to solder the leads on an armature, whereas with gasoline torches six hours were required. The combination of gas and compressed air is also used for burning paint off cars.

The cars are cleaned with Imperial car cleaner emulsion, which is applied as follows: Smear sides of car with emulsion; follow with paint shop scrubbing brush; wash off with clean water; apply oil cleaner and rub off with dry clean waste. The waste thus impregnated with oil cleaner is afterward used in ordinary car cleaning. It has been found that by cleaning cars in this manner every two months the life of the varnish has been increased about 50 per cent.

PAY-AS-YOU-ENTER CARS, ATLANTA, GA.

On Dec. 7, 1910, the Georgia Railway & Electric Company, Atlanta, Ga., began pay-as-you-enter service with four specially built cars under license of the Pay-As-You-Enter Car Corporation. Since Dec., 7 the company has constructed 26 more cars. It is the company's intention that all the new cars for strictly city use shall be of this type, provided that the pioneer cars do as well as expected. The company will not undertake to reconstruct any of its old cars, as this would be a very costly process in view of the operating conditions which prevail in Atlanta.

The new cars are of pleasing and substantial design, as shown in the accompanying half-tone, cross-sections, framing layout and seating plan. They are 40 ft. $8\frac{1}{4}$ in. over all, with 27-ft. $8\frac{1}{4}$ -in. bodies, thus giving platforms $6\frac{1}{2}$ ft. long over all. The bottom framing is heavily reinforced by steel plates; there is also a steel truss in the window pockets running from end to end of the car upon each side. The platforms are carried on angle irons $\frac{1}{8}$ in. x $\frac{1}{4}$ in. x 6 in. The lower side panels of the car are formed of $\frac{1}{4}$ -in. plate, 16 in. high. The rest of each side up to the window-sills is of



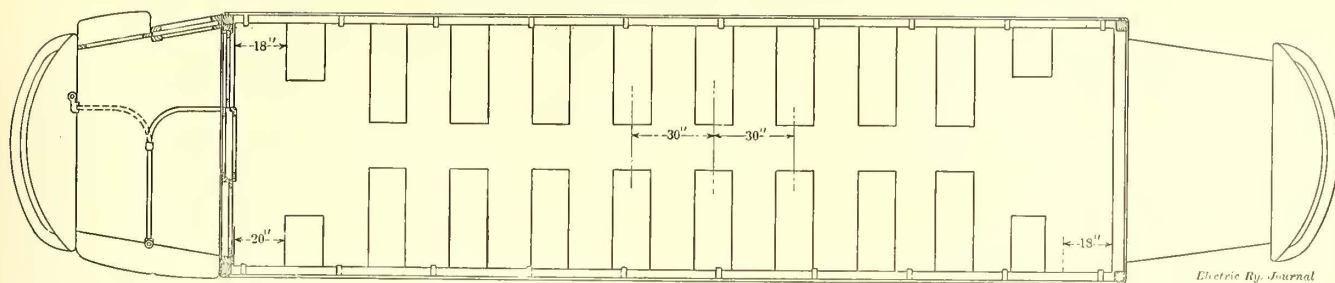
Atlanta Car—Half Cross Section, Showing Bulkhead and Finish, Bolster, etc.

poplar. Other members of the car framing are shown in the half elevation and half section.

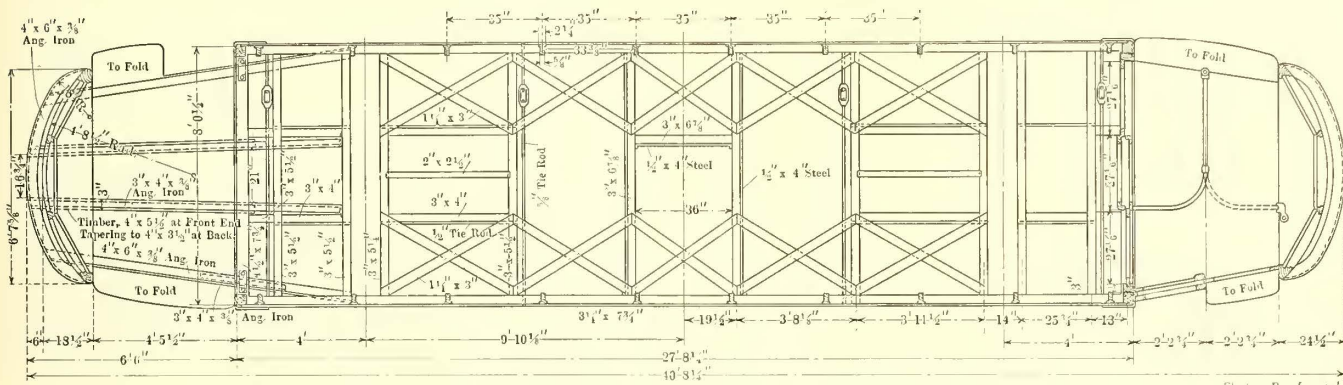
The seating arrangement consists of double reversible cross-seats, but opposite the body end doors a shorter single seat is installed which is exactly the same in construction, finish and operation as the other seats—that is, it is a reversible seat which can be moved away from the opposite door whenever maximum clearance is desired. This seating plan permits considerable freedom in entering or leaving the car body.

The cars are made for double-end operation, the forward end having the usual sliding-door to cover the exit whereas the rear platform has both an entrance and an exit aisle. When the car is in motion all gates and doors are closed except that which would close the entrance. By means of a lever the motorman controls the front exit door and the folding step operated in connection therewith. A fixed step is used on the side of the platform.

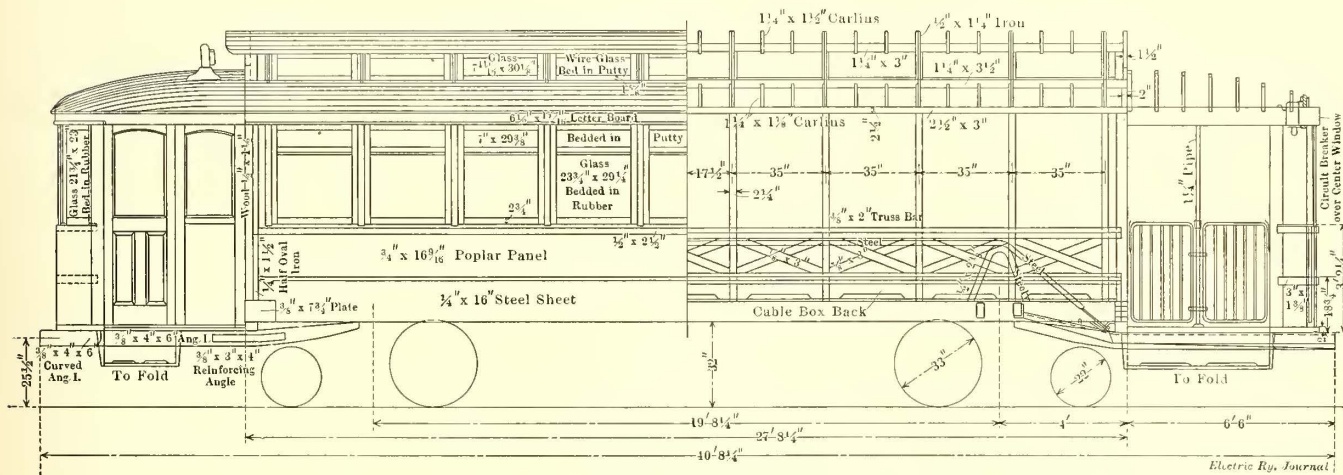
Perhaps the most interesting feature in connection with the



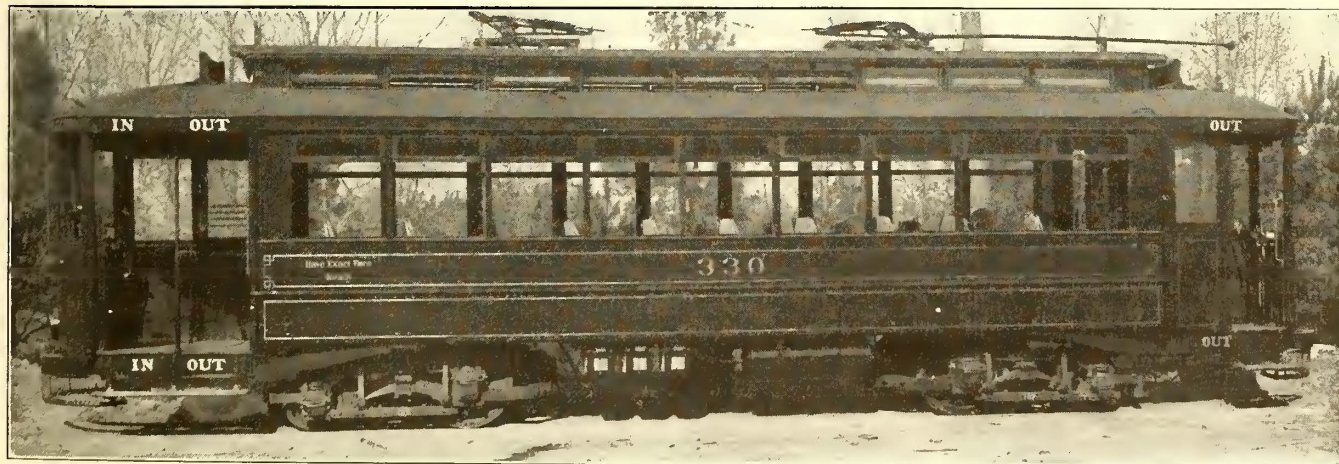
Atlanta Pay-As-You-Enter Car—Platform and Seating Plan. Showing the Reversible Single-Passenger Seats at the Corners



Atlanta Pay-As-You-Enter Car—Floor and Platform Framing



Atlanta Pay-As-You-Enter Car—Half Side Elevation and Half Side Section



Atlanta Pay-As-You-Enter Car—General View of Completed Car as Built and Equipped by the Georgia Railway and Electric Company

availability of these cars for pay-as-you-enter service is the truck. The company felt for a long time that it could not take advantage of the prepayment system because longer platforms seemed impossible in the narrow streets of Atlanta, as this condition would give clearance trouble from the proximity of curves at certain street corners. The problem was solved by the application of the Brill 39-E maximum traction truck, which permits the use of a longer platform and at the same time allows the necessary clearance. It will be noted from the accompanying half-tone and the side elevation that the pony wheels are placed nearest to the ends of the car so that they can swing under the platforms if necessary. The weight of this car completely equipped is about 33,500 lb. As it seats 36 passengers, the weight per seat is 930 lb. This weight is considered very satisfactory in view of the large platform space, the substantial construction and the character of the equipment on this car.

Each car carries two Westinghouse 112 B-2 (75-hp) motors and the National Brake & Electric Company's A-4 air brakes. The cars were built and equipped in the shops of the company under the direction of W. H. Glenn, vice-president and general manager of railways, and A. M. Moore, master mechanic.

About two weeks prior to the inauguration of the pay-as-you-enter service the trainmen on the routes over which the cars were to run were taken to the shops, where every detail of operation was explained to them. They were then allowed to take the cars out of the shops and run them over different lines in the city in order to familiarize themselves with the behavior of the car in passenger operation. For the education of the public several advertisements were placed in the Atlanta papers giving the date when the first cars would be placed in service and explaining the superiority of the new design over the old type. The public was also urged to co-operate in making the new cars prove a benefit to the service. These cars have no fare boxes, but are equipped with the ordinary hand register. The register cord is immediately over the conductor's shoulder as he stands on the platform at the dividing rail.

ILLINOIS TRACTION SHOP AT OTTAWA, ILL.

The new shop which the Chicago, Ottawa & Peoria Railway is erecting at Ottawa, Ill., is to be built of structural steel, brick in cement mortar, with concrete foundations set on solid rock. It will be 301 ft. 2 in. x 62 ft. 2 in. in ground dimensions. The height inside from the top of the floor to the lower chord of the trusses will be 34 ft. The roof will have a pitch of 1 in 5 and will be surmounted by a monitor roof 260 ft. long. The building will inclose three repair tracks, two of which will have repair pits 162 ft. long, which will have concrete walls and floors with the side walls paneled and pocketed for the reception of steam pipes and lights for illuminating the pits. The entire building is to have a concrete floor arranged with suitable floor drains. Sanders Brothers, Ottawa are the general contractors.

In the northeast corner of the building will be located a three-story office structure, the lower floor to be used as a tool and store room, the second floor for an office and the third floor for a drafting room. There will also be a space 36 ft. x 120 ft. inclosed by a galvanized iron partition and one wall of the office, to be used as a paint shop. A suitable crane way for supporting a 15-ton traveling crane will be installed. Structural steel brackets will be mounted upon the steel columns for the reception of line shafts and countershafts. The steel in the building will be strong enough to sustain a future addition on the south side which will consist of a saw-tooth structure 48 ft. wide, extending the entire length of the building. The shop will be equipped with a wheel press, lathes and other machinery for an up-to-date electric railway repair shop, all this machinery to be motor-driven. A freight repair yard will be constructed in connection with the shop. This yard will have seven tracks and a turning "Y" and loop. The foregoing information has been supplied by J. M. Bosenbury, superintendent of motive power and equipment, Illinois Traction System, Peoria.

WORK OF LAYING POWER CABLE UNDER THE CONNECTICUT RIVER

The Ætna Construction Company, of New Haven, Conn., has just completed the installation of a 11,000-volt submarine cable across the Connecticut River for the New London & East Lyme Street Railway Company. This cable is now used in supplying power to the Flanders substation of the latter company from the Shore Line Electric Railway Company's power house on the Connecticut River.

The cable crosses the river about 100 ft. below the piers for the new county bridge, which may be seen in one of the photo-

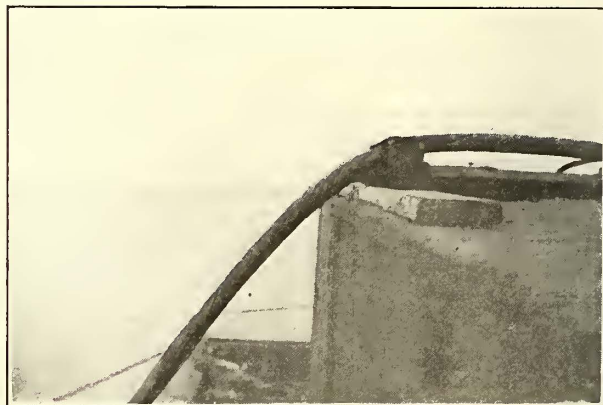


Reel of Wire on Scow.

engravings. The river at this point is about a half-mile wide, and the tide is said to exceed 6 m.p.h. This strong tide, combined with the great amount of ice always drifting down at this season of the year, greatly increased the engineering difficulties. The cable after crossing the river mounts a terminal pole on each shore, where connection is made to the transmission line through potheads.

A trench was dug about 8 ft. wide and 5 ft. deep from bank to bank to conform with the requirements of the United States Engineer's Office of this district. The material taken from the trench in the navigable portion of the stream was loaded upon scows and carried away.

The first engraving shows the reel of cable, which weighed from 6 tons to 7 tons, mounted on a cradle of old timbers. This reel revolved on the shaft as shown, a piece of timber



End of Scow, Showing Cable Passing Into River

under the side of the reel being used for braking purposes, and owing to the strong tide, it was in constant use. The cable passed from the under side of the reel to the top of the stern deckhouse and then over the end, as shown in the second illustration.

Owing to the steep embankment on the east side, the cable was started from this end, where it was run up to the terminal poles. Then the scow upon which the cable was mounted was started out into the stream. Alongside of the scow, and made

fast to it, was the dredge used in excavating the trench, the dredge being used to pull the scow across by means of lines made fast to the nearby piers. Owing to the comparatively narrow trench, a diver followed the cable across to see that it was laid properly in the trench. The scow was kept in line by means of ranges placed between the terminal poles on shore. The engineer in charge, by using binoculars, could always see the ranges and thereby keep the scow in line. After the scow reached the west shore enough slack was let out so that the cable could be pulled up to the poles without too sharp a bend. The cable was pulled up on each shore by the engines on the dredge, care being taken to distribute the pulling strain along about 25 ft. of the cable.

After pulling the cable off the reel it was dropped over the side of the scow into the trench. Trees were encountered which had rolled down the bank after the trench had been dug and had to be sawed apart by the diver to allow the cable to fall in place. If these trees had not been encountered the cable might have been laid in a somewhat shorter time. The cable was laid and ready to be connected up in a day. Only eight men, including the diver, his tender and the man at the pump, were used on the scow and dredge. The engraving below shows a field of ice which came down just after the boats got across. This gives some idea of the condition of the river at the time.

The cable was composed of three-wire, seven-strand No. 4 B. & S. copper conductors, each surrounded by 8/32-in., 30 per cent rubber compound, taped and jute filling. All was then



Connecticut River at Point Where Cable was Laid.

surrounded by tape and two layers of jute serving, protected by No. 8 B. & W. gage wire armor. The test voltage was 27,500 volts between conductors and conductors to ground. The American Steel & Wire Company was the manufacturer. E. S. Glines, of the Ætna Construction Company, was the engineer in charge of the work, acting under John Sanders, electrical engineer of the same company.

JOINT COMMITTEE ON CONVENTION LOCATION

The following joint committee on convention location to investigate the subject of the selection of a place for the next convention of the American Electric Railway Association and report to the executive committee of the association has been announced.

Representing the American Electric Railway Association: James F. Shaw (chairman), New York; John I. Beggs, Milwaukee, Wis., and J. H. Pardee, New York.

Representing the American Electric Railway Manufacturers' Association: Charles C. Castle (chairman), W. L. Conwell, K. D. Hequembourg and George Keegan, all of New York.

The following have also been appointed as alternates by the Manufacturers' Association: Joseph R. Ellicott and Henry C. Evans.

It is expected that this committee will hold a meeting at an early date.

SIMPLE DIRECTIONS FOR FIRST AID TO THE INJURED

Dr. J. J. Moorhead, chief surgeon of the Interborough Rapid Transit Company, New York, has contributed an article on "How to Give First Aid to the Injured" to the February number of the *Interborough Bulletin*. The methods call for no special equipment and are explained in such simple language that it has been considered worth while to republish them substantially in full as follows:

GENERAL

"Prompt action in the case of an accident to a passenger or a fellow employee may often save life or shorten the period of disability. It is not intended that employees should administer more than emergency treatment, nor should any employee undertake to advise or treat the injured. The services of an ambulance surgeon or other physician should be obtained, but pending his arrival much valuable time may be lost. This is especially true in injuries attended by bleeding. The following suggestions are such as can be put into practice readily by any employee while awaiting the arrival of the doctor.

WOUNDS AND BLEEDING

"The body is supplied with elastic pipes (called arteries and veins) through which the blood flows. The arteries flow *from* and the veins *toward* the heart. When the skin is torn or cut to any extent, the pipes carrying the blood are opened and the blood flows out; if a big pipe is cut this flow may be large in amount and rapidly fatal. When arteries are opened the blood usually spurts and is generally bright red; when the veins are affected, the flow is slower and darker. If the wound is big the flow is too great and sudden to clot at once, and help is needed to stop the flow.

"There are only two ways to stop excessive bleeding: To plug the hole in the pipe; to cut off the supply through the pipe. Both of these means, fortunately, can be used instantly and no special apparatus or skill is needed. The commonest wounds are those received on the head, the arms and the legs.

WOUNDS OF THE HEAD

"Practically all of these can be stopped or checked by the use of pressure on the wound—plugging the hole in the pipe. To do this, fold your handkerchief up into a hard square and place it over the wound and hold it there *firmly* with your fingers or the palm of your hand. A piece of *clean* cotton waste or any piece of *clean* cloth will answer. If there is any very hot or very cold water at hand, soak the cloth in it first, as heat and cold also aid in the clotting. If no cloth is at hand, use the tip of your thumb, your fingers or the ball of your palm. Press firmly; if the blood oozes through, don't worry about that so long as you keep up the pressure. Another way to stop bleeding from the head (if it is in the scalp) is to tie a handkerchief, a cord or a rubber band around the head on a level with the eyebrows and the two bony bumps just back of the ears; in other words, you encircle the head tightly a little lower down than the place where your hatband rests.

WOUNDS OF THE ARMS

"The main pipe that supplies the arm runs from the chest to the arm in the armpit; you can feel it throb by pressing your fingers deeply into your own armpit. Any reasonably small amount of bleeding can be stopped in this part of the body by the same means as given above for bleeding of the head or scalp—that is, by pressure. If the bleeding is of large amount (as where a finger or part of the arm is crushed or cut off) don't try to stop it by pressure, but immediately cut off the supply of blood by tying a handkerchief, a strap, a piece of cord, shoelace, suspender, belt, or necktie around the arm *above* the place that bleeds. You can always stop bleeding from the end of a finger by tying the bleeding finger close to the palm; but in any other part of the arm put the cord (or whatever you use) around the arm *above the elbow*—always remember that you must cut off the flow above the wounded place. You can make your cord as tight as you please by putting a piece

of stick under it and twisting until you have made a ridge in the flesh as the cord tightens. Raise the arm so that it points straight up after you have applied the cord around it. If you put such a cord (doctors call such an appliance a tourniquet) just below the armpit and set it tight, not a drop of blood will flow below your cord.

WOUNDS OF THE LEGS

"The main pipe that supplies the leg comes out of the abdomen on the inner side of the groin and then runs down the limb. The same suggestions as given above for the arms will answer for bleeding in this section of the body. If the wound is small and does not spurt or bleed much you can stop it by the pressure of a piece of cloth; if that doesn't answer, or if the wound is large, gaping or spurting, then tie a cord or strap, or your belt or suspender, around the leg *above* the place from which the bleeding comes. Any such cord tied around the leg *close* to the body will prevent even a drop of blood going down into the limb. Raise the leg up as high as you can after you have put a cord around it.

GENERAL HINTS

"Stop the bleeding before you move the injured person; any additional moving may make the bleeding worse. Make him as comfortable as possible by placing him on his back, elevating the injured part. When much blood is lost fainting often occurs and the injured person then becomes unconscious. It is wisest to let the doctor arouse such a person. Stimulants are best given by the doctor; whiskey and brandy are among the best of these.

"Don't get rattled; know what you are going to do and then do it deliberately. Don't be rough or clumsy. Don't use any liquid, powder or anything else on a wound—you may cause blood poisoning. Beware of carbolic solutions.

"What has been said above is intended to apply only to emergency cases in which there is free bleeding. Do not touch the *ordinary* wound with your fingers under any circumstances, because you may have some germs on your hands that will cause blood poisoning even from a small cut. A perfectly clean cloth is the only safe thing to put over an ordinary wound. You can make a safe dressing of any cloth if you will heat it to the point of charring over a flame and then put it on the wound while it is still warm.

"Think of a bleeding blood vessel in the same way as you would think of a leaking pipe of any other sort, and that will enable you to carry out the foregoing successfully and in a way that may save your own or another's life."

INTERNATIONAL ELECTRICAL CONGRESS AT TURIN, ITALY

An international electrical congress is to be held at Turin, Italy, from Sept. 9 to 20, 1911, inclusive, under the auspices of the Italian Electrotechnical Association and the Italian Electrotechnical Committee during the period of the International Exhibition of Industry and Labor. The several committees include the most prominent men in the Italian electrical field and also many important government and university officials. The honorary committee is under the patronage of the Duke of Abruzzi. From Sept. 11 to 16, inclusive, the international committee on electrotechnical standardization will convene at Turin. Invitations to attend this and other meetings have been sent to electrical engineering societies throughout the world. The organizing committee has prepared an official list of the subjects for which it will appoint lecturers, but besides this feature numerous original papers are to be presented by attendants at the congress. The opening ceremonies will take place about Sept. 9. The subscription for membership has been fixed at 25 lire (about \$5). Membership carries with it the right to attend all meetings, to vote and to receive a copy of the printed transactions. On payment of an additional fee of 10 lire (\$2) friends of the members may attend the meetings, but will not have the privilege of voting. The official subjects for discussion are 31 in number. Among them

are the following of electric railway interest: Present State of Technical Progress in the Manufacture of Stationary and Traction Batteries; Underground High-Tension Networks in Metallic Connection with Overhead Lines; Methods of Cooling Transformers of Moderate Size; Converters, Rectifiers and Motor Generators; Single-Phase Traction Versus Three-Phase Traction on Main Lines; High-Tension Direct-Current Traction Versus Single-Phase Traction on Suburban Lines, and Overhead Line Construction for Electric Railways. The papers may be submitted in French, English, German or Italian, when accompanied by a translation or, at any rate, by a summary in French. All of the languages mentioned will be admitted in the discussions. Papers should be forwarded under registered cover not later than June 30, 1911, to the secretary of the organizing committee, G. Semenza, 10 via San Paolo, Milan, Italy.

REPORT ON RECONSTRUCTION OF ACCOUNTS OF PHILADELPHIA RAPID TRANSIT COMPANY

A short reference to the report made by Vollum, Fernley, Vollum & Rorer, public accountants, upon the Philadelphia Rapid Transit Company was published in last week's issue. The full report, which is now available, is based on a thorough examination of the transactions covering the period from July 1, 1902, to Dec. 31, 1910. It states that when the books were opened as of July 1, 1902, no entry was made of the stocks delivered to the company or of the bond obligations assumed by the company as lessee. These were incorporated in the books as a matter of record. Table I, published herewith, shows the condensed balance sheet as of Dec. 31, 1910.

TABLE I.—CONDENSED BALANCE SHEET AS AT CLOSE OF BUSINESS, DEC. 31, 1910.

ASSETS.	
Leases, franchise, construction, equipment, advances to leased lines, sinking fund, etc.....	\$99,107,715
Cash in bank and with agents.....	\$861,403
Securities from fire insurance fund.....	1,200,000
Supplies, materials, prepaid items and accounts receivable	1,069,071
Total assets.....	\$102,238,189
LIABILITIES.	
Bonds, mortgages, ground rents, etc.....	\$67,064,008
Accounts payable, accrued payroll, accrued tax on capital stock and loans, etc.....	507,125
Accrued taxes, fixed charges, etc.....	1,149,233
Accrued accident reserves.....	1,433,603
Accrued renewals	1,500,000
Total liabilities	\$71,653,969
Capital stock Philadelphia Rapid Transit Company paid in	29,977,120
Surplus as at Dec. 31, 1910.....	607,100
	\$102,238,189

Following the balance sheet are schedules which give details regarding the principal accounts. The report says in reference to the amplified statement of the entry of \$99,107,715:

"Franchise account, represents the cost of organization and expenses incident thereto, \$577,820.

"Leases, etc., \$12,673,066. This account represents the value of equities acquired by the Philadelphia Rapid Transit Company under its leases, not heretofore appearing on the books of the company, as follows: Value of leases covered by bonded indebtedness, \$10,853,761; value of stock acquired to protect operations of leased lines, \$319,305; lease value of Market Street Elevated Passenger Railway Company, \$1,500,000; total, \$12,673,066.

"The balance of this schedule is in itemized detail and requires no explanation with the exception of:

"Unamortized debt discount and expense commission on sale of bonds, \$147,467. This is the remaining value as an asset which is deducted annually until the maturity of the bonds sold.

"Strike account, \$934,346. This account will be reduced annually until extinguished."

In reference to the profit and loss account, which is published herewith, Table II, the report says:

"This account starts with the deficit shown by your published report of June 30, 1910, and has been readjusted upon the following recognized principles, from July 1, 1902, to Dec. 31, 1910:

"1. That all costs of organization are capital expenditures and not operating expenses.

"2. That upon an operating company taking over a plant all expenditures made to bring said plant to a normal operating condition are expenditures of capital and should not be charged to operating expenses.

"3. That the cost of selling bonds should be spread over the life of the bonds, and should not be charged to an expense of a single year.

"4. That any extraordinary outlays, such as expenditures for strikes, etc., should not be charged against the year in which such outlays occurred, but should be distributed over a number of years.

"The accounts affected by these principles are as follows, all of which had been charged to operating expenses or directly to profit and loss: Strike account, \$934,347; franchise account, \$412,495; reconstruction account, \$1,348,096; commission on bonds, \$147,467; total, \$2,842,405.

"The balance of the items in this schedule are bookkeeping adjustments made on audit of the accounts, with the exception of a charge of \$1,250,000 as a reserve for accrued accident claims.

"An examination of the claims docket showed a large number of claims in suit and the reserve above mentioned was created as being a very fair valuation of the liability of the company on this account.

"The result of this readjustment shows that the company has a surplus as of Dec. 31, 1910, of \$607,100."

TABLE II.—PROFIT AND LOSS ACCOUNT.

Deficit June 30, 1910.....	\$1,118,609	
Loss on fire insurance fund securities.....	108,854	
Depreciation insurance fund securities.....	134,553	
Taxes on capital stock, Real Estate Holding Company.....	72	
Strike account.....	1,674	
Commission on Philadelphia Rapid Transit bonds...	30,000	
Reserve for accrued accident claims.....	1,250,000	
To reinstate amount charged June 30, 1910, account of sinking fund Philadelphia & Willow Grove Railway bonds.....		\$10,000	
Net profit from operating, six months ending Dec. 31, 1910.....		200,745	
Income from fire insurance fund securities.....		43,498	
Adjustment of excess in comptroller's account prior to 1907.....		49,883	
Adjustment of payment Union Traction Company advance account, Fairmount Park & Delaware River bonds.....		12,083	
Adjustment of accrued accounts.....		80,509	
Adjustment maintenance power.....		11,829	
Adjustment strike account.....		934,347	
Adjustment franchise account.....		412,495	
Adjustment reconstruction account.....		1,348,096	
Adjustment commission on bonds.....		147,467	
	\$2,643,762	\$3,250,862	
Surplus Dec. 31, 1910.....	607,100		
	\$3,250,862	\$3,250,862	

A statement of operations for the six months ended Dec. 31, 1910, shows passenger receipts of \$10,272,381 and chartered ear receipts of \$6,650. Operating expenses were as follows: Maintenance of ways and buildings, \$475,103; maintenance of power plant, \$740,344; maintenance of equipment, \$530,316; transportation, \$2,594,838; general expenses, \$1,005,824; total operating expenses, \$5,346,426. The gross profit from operating was \$4,926,606 and income from other sources amounted to \$286,973. From dividends on stock the company received \$159,898. Total income was \$5,379,476. Taxes, interest and rentals aggregated \$5,178,731, leaving a net surplus on operation of \$200,745.

In the six months ended Dec. 31, 1910, the passenger receipts of \$10,272,381 compared with \$9,880,809 for the corresponding period of 1909, an increase of \$391,572. The number of passengers carried was 251,398,989, as compared with 238,912,091, an increase of 12,486,898.

Stockholders of the Philadelphia Rapid Transit Company voted upon five matters at the special meeting of Feb. 28, as follows:

1. An increase of the indebtedness of the company from \$5,000,000 to \$15,000,000.

2. The authorization of an issue of \$10,000,000 of 5 per cent gold bonds and the execution of a deed of trust securing the same, being the increase of indebtedness above mentioned.

3. The assignment and transfer to the Union Traction Company, of Philadelphia, the lessor of this company, under lease dated July 1, 1902, of all the interest and equity of this company of every kind in the Market Street Elevated Passenger Railway, the Darby & Yeadon Street Railway, the Doylestown & Willow Grove Railway Company, and in all other railway properties acquired since July 1, 1902, and the transfer to this company of said interests and equity under lease without additional rental, the same as if they had been part of the Union Traction system leased to this company July 1, 1902; such transfer to be in consideration of the guarantee by the Union Traction Company, of Philadelphia, of the payment of the principal and the interest of said bonds from time to time maturing; a provision relating to said guarantee being that the proceeds of said bonds shall only be expended on property leased to this company under the lease dated July 1, 1902, or, if expended on other property, such other property shall become subject to the conditions of said lease and as though a part of the property covered by it, until the payment by this company of all of said bonds, when such other property shall be retransferred to this company.

4. Assent to an increase in the capital stock of the Market Street Elevated Passenger Railway.

5. The approval of a new system of keeping the books and accounts of the company.

The directors of the Philadelphia Rapid Transit Company were also authorized to execute an agreement covering the formation of a voting trust for five years. Rudolph Ellis, A. E. Newbold and George H. McFadden have been appointed voting trustees.

Stockholders of the Union Traction Company of Philadelphia voted on Feb. 28 to approve the general plan, as follows:

1. An increase of the indebtedness of the company from \$3,000,000 to \$13,000,000.

2. The guarantee of the principal and interest of an issue of \$10,000,000 5 per cent bonds of the Philadelphia Rapid Transit Company, said guarantee representing the \$10,000,000 increase in indebtedness above mentioned.

3. The acceptance of transfers of interests in street railway properties from the Philadelphia Rapid Transit Company and the vesting in said company of the full rights of a lessee in the properties so transferred without additional return to this company.

4. The pledging with the trustee for the said \$10,000,000 bond issue of all the interests of this company, heretofore or hereafter acquired, in the Market Street Elevated Passenger Railway.

5. Assent to an increase in the capital stock of the Market Street Elevated Passenger Railway.

In a reply to Frederick G. De Witt, district attorney of Queens County, in relation to a resolution of the Grand Jury, of Queens County in reference to the service furnished by the New York & Queens County Railway, Long Island City, Travis H. Whitney, secretary of the Public Service Commission of the First District, said in part: "The increased traffic has exceeded expectation so that the new equipment has not relieved the situation to the extent expected. The reason that open cars were operated so late last fall was that the number of closed cars was not sufficient to keep up a satisfactory schedule. Our recent inspection covering all lines shows that the service now furnished is about as good as the average street car service in the greater city. Overloads are carried during certain hours, but overloads are inevitable throughout the city during the same hours. So far as we have been able to ascertain by frequent temperature tests the provisions of the heating order are being complied with."

HEARING BEFORE RAILROAD SECURITIES COMMISSION

The Railroad Securities Commission held its final public hearings in New York on March 6 and 7. All the members of the commission were present at the hearings, which were held at the office of J. & W. Seligman & Company, 1 William Street.

F. J. Lisman testified before the commission with particular reference to the subject of branch lines. He stated that if existing lines of railroad were 30 miles apart in good territory there was room for another line. The business of constructing branch lines was almost a business by itself. Many such lines had been built for the transportation of lumber and had been torn up after the lumber had been moved. They would never be reconstructed for permanent operation if an attempt was made to require the payment of stock issued by the owning companies at par. If the roads were torn up the countries through which they ran went to seed.

One of the commissioners asked about the equity behind the bonds on the property. Mr. Lisman said that the small branch lines would not earn very much at the beginning. They were given land for right-of-way free and often received for nothing all the timber they needed. Local men who were interested would frequently give their time and service without charge.

Nobody would think of taking up an enterprise of this nature without getting some benefits therefrom. The incentive had to be capitalized. He would let the common law regulate the issue of securities. The subject of the mortgage in most cases was from 60 per cent to 80 per cent of the fair cash cost of the property. Small lines could be built for less and operated for less under independent direction than by a large railroad system. He had found that promoters had often spent \$25,000 per mile in construction and had not secured as good results as he could get for half of that amount. It would not be fair to say in such cases that each would be entitled to simply the cost of the property. When the public wanted a railroad it was not interested in the cost; it wanted the facilities.

In the construction of branch lines in the South local labor was secured at the rate of 90 cents or \$1 a day.

In answer to a question regarding rates, Mr. Lisman stated that a small line had to get 1 cent or 2 cents per 100 lb. more on freight than an established system in order to live. Any railroad was a benefit to the people located on the line. There was a property equity if not a cash equity behind the bonds of such companies. Persons could not afford to build such properties for merely the bond dealer's profit. It was not possible to measure out all the risk involved in the construction of new properties by doling out a little stock as compensation for the promoter.

Louis D. Brandeis, who represented shippers in the cases tried before the Interstate Commerce Commission recently, presented a written statement to the commission which he amplified when he appeared at the public hearing. Mr. Brandeis insisted that improvements in railroad service would come only with increased efficiency of management and the application of economies. He stated that the regulation of interstate street railways and of lighting corporations in Massachusetts was very effective. It was all that any one could ask. The amount of water that had been permitted in the capitalization of such properties was almost negligible. The Massachusetts law was not an undue hindrance to the development of enterprises. On the other hand, the law of Massachusetts had broken down absolutely with respect to the control of interstate railroads. A striking example of this was afforded by the New York, New Haven & Hartford system.

The Boston & Albany and Boston & Maine railroads, which had fallen into the hands of persons and corporations not subject to the laws of Massachusetts, had been unprogressive, Mr. Brandeis said. The curb to ambition arising from the fact that rates of dividends on the stocks were limited had had its influence in the policy of these companies. To limit dividends would be the one most serious evil that would be absolutely fatal to success. While capital as capital was entitled to a

very low return, capital so far as it was a potent force, involving judgment and ability, should receive returns commensurate therewith. Capital invested in public service corporations should receive a return commensurate with the degree of good service rendered, not with the degree of risk involved. Mr. Brandeis could imagine companies where practically no risk was involved, but where the service rendered would warrant a large return. He referred to the sliding scale system of rates and dividends which prevails in the organization known as the Massachusetts Gas Companies of Boston.

Mr. Brandeis suggested the establishment of a governmental bureau to act as a clearing house for the purpose of determining what railroad costs and service should be, and of receiving, analyzing and disseminating information regarding economical railroad operation.

Prof. Henry C. Adams, statistician for the Interstate Commerce Commission, supplemented on March 7 the testimony he gave at the Chicago hearing of the commission. He believed there should be a supervisory body to regulate the issue of new securities, but that it should not have to follow arbitrary laws which, in his opinion, would be less reliable than the free exercise of wide discretionary powers.

ELECTRICAL IMPROVEMENTS OF THE DETROIT UNITED RAILWAY

The Detroit United Railway will construct a chemical laboratory near its main power house at Riopelle and Atwater Streets, Detroit. A separate building to contain the laboratory is now under construction. It will be 22 ft. x 40 ft. in size and will be well equipped. It is expected that the laboratory will be completed by June or July.

Included in the work which will be done at the laboratory is the testing of coal. All devices necessary for coal testing will be provided and the company hopes to purchase its coal by specification later. The practice of the company has been to have its coal tested at intervals at an outside laboratory, but it is desired now to know what can be saved or lost by the purchase of coal on specification. A chemist has been employed by the company and has been engaged for the last year in making furnace analyses. He has made general flue analyses showing the temperature, amount of air draft, etc. The company will also analyze its building materials and other classes of materials which enter into power house construction, such as pipe covering. Oil is being purchased on specification.

The Detroit United Railway has installed recently a 3000-kw Westinghouse-Parsons 25-cycle, 6600-volt turbine together with eight 500-kw synchronous motor-generator sets. In the purchase and arrangement of this apparatus it was necessary to construct underground lines in the street in which three conductor cables of proper capacity were installed. This is the beginning of a series of substations which will be constructed around the City of Detroit to be connected by the belt-line method, feeding back into the general system and thereby equalizing with the main power house.

The company has used electric light switch stands independently lighted for three years on one interurban division and has now extended this improvement to all divisions of the interurban system. A separate circuit is run from each substation so that it covers all switches between the substations.

The information regarding these improvements has been received through the courtesy of E. J. Burdick, superintendent of power, Detroit United Railway.

METROPOLITAN STREET RAILWAY REORGANIZATION

The hearing by the New York Public Service Commission, First District, in relation to the plan for reorganization of the Metropolitan Street Railway was adjourned from Feb. 28, the last date fixed, to March 22, in order to give representatives of the company and of the commission sufficient time to go over some of the details which are to be considered.

COMMUNICATION

BLOCK SIGNALS FOR SINGLE-TRACK LINES

OREGON ELECTRIC RAILWAY COMPANY

PORTLAND, Ore., Feb. 28, 1911.

To the Editors:

I have read with interest the article on "Automatic Block Signals for Electric Railways" by W. K. Howe, of the General Railway Signal Company, published in your issue of Feb. 11, and agree with the writer as to the system of signaling to be used, but I do not agree with him in his proposed method of attempting to cheapen the cost of installation by using "call on" signals or permissive blocking in single-track operation. This indication, when used, is primarily for following movements on double track and should never be used in single-track operation, as it becomes a menace instead of a safeguard. To illustrate: A train inferior by direction enters a block, thereby setting the semaphore at stop and displaying a yellow light which allows an extra following to enter the same block "under control." Both the above trains are to meet an opposing train of superior rights by direction, the first named train by time card rights and the extra by authority of a train order. The regular train may be delayed, and finds that it cannot make the meeting point, drops a flagman and starts to back to the station. This may result in a rear end collision if the train backing is not preceded by a flagman, or the following train may not be "under control" and may strike the first train before a flagman can get back.

The omission of intermediate signals is not justified on account of serious delays which will result without their use. In order to obtain proper protection "overlaps" must be used

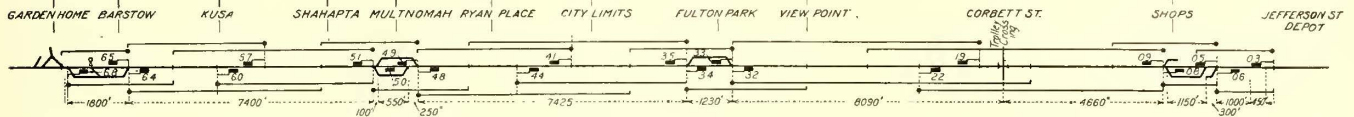


Diagram Showing Proposed Block Signal System on Oregon Electric Railway

and with a train occupying the main line at one station an opposing train is blocked one station away. This method has been tried on comparatively short blocks and has been discontinued for the above reason, and also for the reason that a train switching at one station, or a switch being left open, prevents any movement from the station beyond.

The writer has designed a layout, shown in the accompanying engraving, for automatic signals between Portland and Garden Home, on the Oregon Electric Railway, a distance of 7 miles. This installation calls for 22 three-position upper left-hand quadrant signals, 14 of which are for station protection. There are two preliminary and six intermediate signals. The control of these signals is so arranged that they are virtually "distant" as well as "home" signals, a 45-deg. indication by day and a yellow light by night indicating that the block ahead is "clear," but that the second block ahead is occupied. This allows a train to enter a block at full speed, provided the indication is "clear," or "caution," and if at "caution" the motorman expects to find the next signal at "stop." All signals are located so they can be plainly seen at distances varying from 1500 ft. to 3000 ft., and it is not necessary therefore to provide a distant signal at station approaches. If permanent obstructions to the view make it necessary a distant signal may be installed at the overlap point with only the additional cost of the signal, as the track is already cut at this point.

The writer is strongly inclined to the use of four signals for the protection of all through sidings, as this system allows movements up to the signals at either end and allows switching movements to be made at such sidings with maximum protection. This is the prime requisite in all signaling, and unless such protection is provided the installation of automatic signals should be deferred until such time as the density of traffic

and finances of the property will justify the expenditure necessary to obtain this protection.

The daily passenger train movement over the district of this division of the Oregon Electric Railway, which is to be equipped with automatic signals, is at present 36 trains per day and will shortly be increased to 48 or 50 trains per day. There are also several freight and work train movements. The character of the trains operated, which in case of passenger trains consist of from two to four cars each, and freight trains from 15 to 40 cars each, requires similar protection to that provided on standard steam lines. Therefore, the cost of about \$3,000 per mile seems to be justified in this particular case.

C. A. COOLIDGE,
General Manager.

REPORT OF THE WISCONSIN RAILROAD COMMISSION

The report of the Railroad Commission of Wisconsin for the year ended June 30, 1910, shows that the total number of electric railways operating in the State was 26. The Grand Rapids Street Railroad was added during the year.

The miles of road, exclusive of road operated under trackage rights, on which these companies operated increased from 586.25 miles on June 30, 1909, to 608.23 miles on June 30, 1910, an increase of 21.98 miles. Operating revenues for the 1910 fiscal year were \$6,788,101, an increase of \$770,181, or 11½ per cent. Operating expenses were \$4,678,363, an increase of \$609,809, or 13 per cent. Net operating revenues increased \$160,372, or about 8 per cent.

A section of the report is devoted to a discussion of the subject of the time required for the disposition of cases. In all cases in which the situation with respect to service was acute

the commission issued temporary orders compelling immediate relief from the conditions complained of justly, or brought about the desired result through informal action, reserving other matters involved for future consideration. The commission refrained from making orders on data which it knew to be less complete than could be made. Clamor for immediate action, the report says, has never tempted the commission to swerve from such a deliberate course as the necessities of the case require. The commission has found that only a certain number of men can prudently be assigned to a certain piece of work. The assignment of additional men to the same work, even when not inexperienced, would result in a relatively large expenditure on the part of the State and a relatively small return of service therefor.

In several cases which have been before the commission for a considerable period of time the utilities and municipalities concerned have been in controversy with one another for many years without reaching a settlement or establishing a truce. The commission, therefore, remarks: "After years of conflict without determining effect with respect to rates and service, it should perhaps not be unreasonable to grant to the commission whatever time is necessary to determine such service and rate questions in a manner which it deems best adapted to carry out the letter and spirit of the public utilities law. In practically no instance during the 50 years since the State of Wisconsin was founded has there been made a record, public or private, which would suffice even tolerably for the establishment of rates and service rules."

Of the issue of new securities authorized during the year \$6,007,000 were to electric railway, light and power companies.

Since the passage of the public utilities law 28 applications for increases of rate have been acted upon by the commission.

In the section of the report relating to the accounting feature of the work the commission states in reference to the subject of depreciation: "The provision of the law relating to a depreciation account has been widely misunderstood and variously interpreted and much additional attention and personal supervision will be necessary before it can be said that this important provision of the law has been complied with."

In discussing recommendations for legislation with reference to the stock and bond law, the commission refers as follows to the construction of the law given by the Supreme Court in a case affecting the Minneapolis, St. Paul & Sault Ste. Marie Railway:

"The law as it now stands, by virtue of such instruction of the Supreme Court, is of little value as a means of ascertaining many important facts relative to past issues of securities of public service corporations which should be matters of record in connection with any new issues of securities. The financial history of such corporations is vital to investors and, if made a matter of record, will accomplish much in preventing overcapitalization of such companies. The law should be so amended as to give the commission the power of investigation which it assumed to possess prior to the decision of the court in the above-mentioned case. It might be well to strengthen the law in other respects. At present the corporation determines the character of securities it wishes to issue, also the purposes for and the terms upon which the same are to be issued. The Legislature could prescribe the purposes for which such securities could be issued, determine the character and limit the amount of the same to that which would be reasonably required for such purposes and leave it to the commission to ascertain whether the purposes are within the terms of the statute and whether the character and amount proposed to be issued are reasonably required for such purposes.

"The broadest powers possible of investigation should be vested in the commission. This, in our judgment, is absolutely essential to effect that which seemed to us to be the manifest purpose of the Legislature in employing the language to which the court has given a different interpretation."

In reference to the engineering staff it is stated that important steps have been taken in the work of the newly established department relating to signaling and interlocking, and to safety of railway travel in general. Considerable further work has been done in the movement toward the revision of certain features of the valuation work performed by the staff. These changes involve special studies as to unit cost, the life of structures and related aspects of this work. There has also been a critical review of the classification scheme governing the valuation work in general. The printed blanks used in gathering from railway companies the inventory and other data required in valuing new roads and in making the annual revisions in the valuation of old lines have been completely overhauled. A revision of forms and classification schemes for electric roads and for the various types of public utilities properties is now in progress and will probably be completed during the coming year.

Informal observations of railroad service are taken by members of the staff while en route in the discharge of their regular duties. These observations relate to such matters of practice as flying switches with passenger trains, failure to test air brakes, lack of protection to trains, unsafety of track and structures, etc.

The more important reports are taken up immediately with the proper officials of the railroad companies, while the less important reports are sent to the general managers of the companies affected at the end of each month.

A systematic inspection and investigation of block signal systems in the State is being made.

Investigations of railway accidents are made as far as possible by those members of the engineering staff who are qualified by previous training to investigate the practical features.

On the subject of the valuation of electric railway properties the commission says: "In the initial steps in the valuation of the electric railway properties of the State originated the

first use of a joint valuation staff serving the Railroad and Tax Commissions. Such joint relationship was provided for in effect in the enactment of the railroad commission law of 1905, which prescribed that data in the office of the State Board of Assessment should be available for the use of the Railroad Commission.

"During the past year the work of the staff, although following substantially the same general lines as in previous years, has been the subject of continued study and criticism with a view of effecting improvements wherever practicable. Following along the lines already mentioned with respect to the steam railroads, there is also under way at present a systematic revision of the valuations of electric railway properties of the State. During the past year the schemes of classification used in these valuations have been recast to conform as closely as practicable with the prescribed classifications of accounts adopted by the Railroad Commission for such properties. Considerable progress has also been made in connection with the revision of unit prices and related details of the work."

Regarding investigations of street railway service the report says:

"Investigations in Milwaukee.—In addition to the special investigations of street railway service in the City of Milwaukee described in a previous report, the staff has been called upon during the past year to make further studies of the data gathered in those investigations for the purpose of supplementing the recommendations previously submitted as to the modifications of the street car routing and extensions of the trackage systems. Certain memoranda were prepared showing the time spent unnecessarily on cars by residents of certain portions of the city due to detouring through the heart of the city instead of using a direct route across the Sixteenth Street viaduct. It was found, for example, that in this one case such direct routing would result in an annual saving of 1,000,000 passenger hours, in round numbers; in other words, that residents in certain sections of the city, for the most part laboring people, would be able to spend these 1,000,000 hours in their own homes instead of in unnecessarily lengthy trips in the street cars operated by way of the present defective routing through the congested downtown district."

"A peculiar feature of the original investigation was the facility with which there could be measured certain traffic requirements which have heretofore been regarded as being more or less intangible in character. A study of the habits or tendencies of the individual classes of passengers by an analysis of the data along special lines showed the resulting trend to travel automatically established by the people. These investigations made it possible to point out accurately the direction of this trend of traffic, thereby furnishing a basis for determining with certainty the natural or established demand for car service on certain streets and in certain districts. The process gave a means of studying the present locations of the various lines with reference to the location of the general trend of traffic, from which it was possible to determine the streets along which franchises would be most valuable to the public as well as to the company. The further fact was brought out, as already indicated for a particular section of the city, that cars were operated over certain sections of track at a decided disadvantage to the public, since it involved a routing of cars neither convenient nor comfortable for the patrons of the company.

"Other Street Car Service Investigations.—Similar street railway service investigations are under way in other cities in the State. It is the object of such investigations to determine the classification of territory served, the amount of traffic, the peak conditions of travel, vacant seats furnished by the company, amount of distortion of headway, and related features of service. It has been the aim to determine the adequacy and convenience of the service provided for the traveling public and to suggest remedies where faulty conditions were found for the information of the commission in rendering its decisions."

AUTOMATIC BLOCK SIGNAL ARRANGEMENT FOR STUB-END SIDINGS

The application of automatic block signals of the trolley contact type to stub-end sidings on single track roads so as to provide complete advance and rear protection involves a number of complications not met with in applying this type of signals to through sidings where the cars pass under the trolley contacts always in the same direction. The Nachod Signal Company has devised an arrangement of its type CD signals to suit the conditions of stub-end siding protection which is simple and effective. Such an arrangement is shown

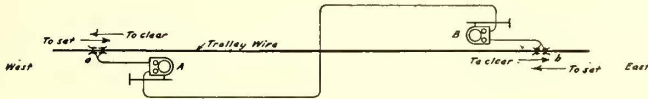


Fig. 1—Pair of Signals Applied to a Single Block

in Fig. 2. Fig. 1 shows a pair of Nachod type CD automatic signals applied to a section of single track, as for curve protection in both directions. Since this forms the signaling unit used the operation will be described before entering into a description of the combination, shown in Fig. 2.

When there is no car on the track *ab* the signals *A* and *B* are neutral, that is, they display neither lights nor disks. This indication authorizes, for example, an east-bound car about to enter the block to run under trolley contactor *a*, but no further, unless the signal then changes to a caution indication, which is a yellow light and a yellow disk. The caution indication is an assurance that at the same time the signal at *B* has changed from neutral to stop, and shows a red light and a red disk. The change to the yellow caution signal authorizes the car to proceed through the block. The distance *aA*, between the contactor and signal, termed the advance distance, is provided for the observance of this change. When the car passes out of the block under contactor *b*, both signals are restored to normal.

Should another or several cars follow into the block before the first has left, as for permissive signaling, each will receive an indication, by the temporary extinguishing of the yellow light, that it is recorded on the relay counter. As the cars leave the block successively, the signals are not restored to neutral until all the cars have passed under the contractor and left the block.

The contactors are without moving parts, but they operate according to the direction of movement of the cars passing under them. Thus a car moving eastward under *a* when the block is clear sets a caution signal at *A* and a stop signal at *B*, but in backing out at *a* it will restore both signals to nor-

are maintained permissive at one end and stop at the other, instead of stop at both ends. Moreover, the signal line wire may be lead through the standard switch boxes, so that an open switch in the block will prevent the display of any proceed signals. In this case the signals will remain neutral, and a neutral signal persisting after the contactor is passed is regarded as a stop signal. Power to operate the signals is taken from the trolley, no batteries or insulated rails being used. The contactors control the signals at speeds of 55 m.p.h.

Fig. 2 shows the same type of signals applied to single track interurban operation in both directions with single-end sidings as passing points. When passing in opposite directions one car heads into a siding and backs out again. It is made up of units as in Fig. 1, arranged with an overlap.

Three conditions may be considered: First, a single car passing from west to east through the diagram, the signal protection ahead and to the rear being described. Second, two cars scheduled to pass at siding *Y*, starting from opposite ends of the diagram and going with equal speed. Third, the same starting conditions, but the west-bound car delayed and the east-bound car continuing to the next siding.

First, an east-bound car in the block to the left, on arriving at *c* sets caution at *C*, and stop at *F*, *D* being already set at stop. The car passing *e* will clear *D*, and at switch point *Y* or before, signal *E* will be seen neutral. At *g* the car will change *E* to caution and *H* to stop. Thus it will be seen that while the car is between *g* and *h* there will be two caution signals, *C* and *E*, for rear protection, and two stop signals, *F* and *H*, for facing protection. At *h* the car will clear *C* and *F*; at *j* it will set a caution signal at *G*, and at *k* it will clear the signals at *E* and *H*, etc.

Second, suppose that two cars run under *c* and *k* toward each other at the same or nearly the same time. The car at *c* sets signal *C* at caution and signal *F* at stop, signal *D* being already at stop. The car at *k* sets signal *H* at caution and signal *E* at stop, signal *G* being already at stop. When the east-bound car gets within sight of *E* at stop, which must be before it reaches *Y*, the motorman prepares to head into siding *f*. At the same time the other car, coming within sight of *F* at stop, is prepared to stop and wait behind *h* until *F* is cleared by the east-bound car passing beyond *f* in the siding. Thus, under favorable conditions for viewing the signals from a distance, the least combined stopping distance from full speed must equal the overlap *EF* between signals, plus the visible range of both signals. Under the worst condition, as in fog, the overlap is the least stopping distance, but at such times the speeds would be limited in approaching sidings. Contactor *f* is located so that after the trolley of the car heading into the siding has passed it the car is in the clear. The distance *Yg*, from switch point to the contactor, is there-

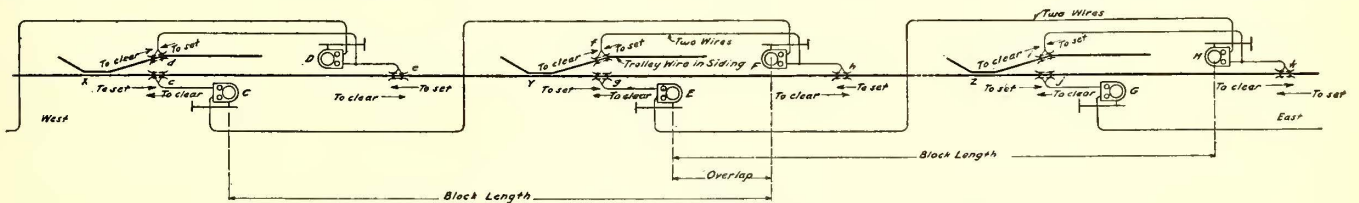


Fig. 2—Block Signal System Applied to Single-Track Line with Stub-End Sidings

mal. While this car is in the block, another car, entering under the contactor *b* against stop signals, will not change the indications, but will be counted in on the relay; and in backing out again this effect will be canceled.

In general, the relay counter controls the display of signals, setting them for the direction of traffic of the first car in the block, counting in every subsequent car entering under either contactor without change of signals, and restoring them to normal only when as many cars have passed out of the block as entered into it. Thus a car entering the block and setting the signals would hold them, even though other cars switched in and out of the block under the contactors at either end.

The operation is as universal as with track circuit signals, with the advantage that, with a car or cars in the block, signals

fore suggested as 100 ft., and the advance distance *gE*, 200 ft. The distance *Yh* may thus be approximately constant, but *hZ*, the major distance, is dependent on the distance between successive switch points *YZ*.

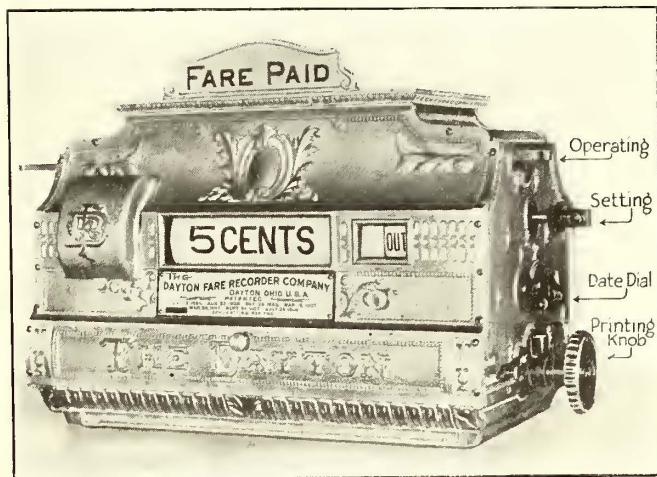
After *F* is cleared, the east-bound car being at the end of the siding, the west-bound car, running under *h*, sets *F* at caution and *C* at stop. At *g* it clears *E* and *H* and passes beyond *Y*. The other car then backing out of the siding at *f* counts in another car on *F*, without changing the signals there, and going east again on the main track at *g*, sets *E* at caution and *H* at stop. At *h* it counts out on *F*, which will go to clear provided the west-bound car has passed *c*.

Third, with the west-bound car in the right-hand block and delayed, the east-bound car on reaching *Y*, the specified meeting

point, finds signal *E* neutral, and after waiting the required time goes forward. At *g* it sets *E* at caution and *H* at stop, at *h* it clears *C* and *F*, and before reaching *Z*, finding *G* at stop, it takes the siding. This clears *E* and *H* at *i* and it then waits for the west-bound car to pass out of the right-hand block.

NEW FARE RECORDER SYSTEM USED IN CHICAGO

During 1910 the Dayton Fare Recorder Company, Dayton, Ohio, began a series of demonstrations on the lines of the Chicago Railways Company with a new multiple fare recorder



Fare Recorder for Inside of Car

and computer. These trials have proved so satisfactory that the company has ordered more machines of this type. This recorder has so many distinctive features that the following description should prove of general interest to all who are concerned in the vital problems which are connected with fare collection.

The recorders are of the multiple-recording type. They indicate, register and compute each kind of fare separately and record the result of the registration in printed records that require no computations whatever by conductors or receivers to determine the amount of the day's collections. The results are worked out in detailed and classified totals by the recorders, and are fully computed in the printed records when they are removed from the machines.

The recorders are adaptable to all types of cars. As used on the pay-as-you-enter cars in Chicago each register occupies a maximum wall space of 10½ in. x 15¼ in. over one end door of the car. In addition to the indication of the denomination of fare paid, which is given by the register itself, additional indicators are placed on each platform and all operate in unison. Thus if the conductor receives a 3-cent fare the indicators on the front and rear platforms and within the car body are set simultaneously to indicate 3 cents before the register is rung. The indicators on the platforms are mounted at about the level of the conductor's eyes and between the two doors in the end bulkhead. They are set by a small handle within easy reach of the conductor and close to the bulkhead. This handle moves all indicators simultaneously through the medium of gearing and a ¼-in. steel shaft extending from end to end of the car. Provision is made to prevent passengers on the rear platform

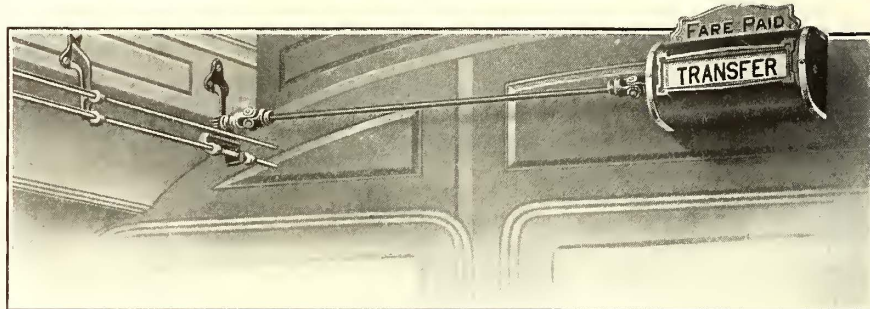
from interfering with the operation of the register or indicator, the handle being removed when not in use.

The register is operated by the conductor by means of a treadle on the rear platform. This treadle can quickly be detached and taken by the conductor to the other end of the car when the direction of operation is reversed.

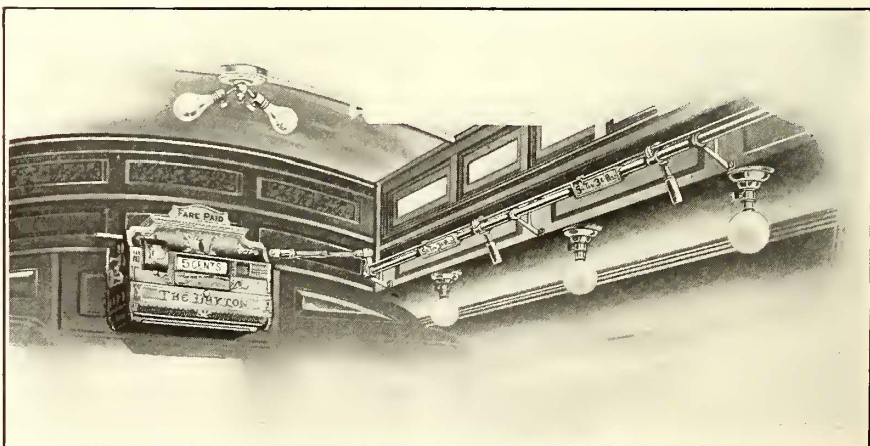
These registers do not show the count of the fares to the passenger, but only the denomination paid and, as earlier stated, this is indicated in three places on the car. For a 5-cent cash fare the register bell gives a clear ring; for other denominations the bell is muffled.

The operating mechanism for regular type cars enables conductors to indicate and register the fares without releasing the operating handle. No ropes or cords are used. The fare indicators are located on the operating rod, a sufficient number being used so that the indications of the fares may be observed from any part of the car. The recorders are at all times locked against unauthorized registrations. When a conductor takes charge of a car at the beginning of his run he first unlocks the recorder, then uses his "conductor's number key" to record his badge number on the printed record, thereby identifying himself with the record of his work. These keys are cut of steel similar to a Yale lock key and are about 3 in. long. Each recorder has a capacity for identifying 9999 conductors and 99 inspectors; the keys are interchangeable.

At the end of the trip the time of arrival is set on the time mechanism, the record of the trip is printed by operating the printing knob (shown on right side of recorder) a quarter turn, and the counters are reset to zero in the usual way. No other operations are required to produce the trip records. At the end of his run the conductor operates the printing mechanism to obtain the total record of the fares collected on all the trips. The total record may be made in duplicate if desired by repeating the printing operation. The conductor then removes the combined trip and total record from the recorder and makes settlement according to the amounts shown therein.



Inside Indicator for Prepayment Cars to Be Used When Desired. It Is at the End of Car Opposite That Occupied by Recorder



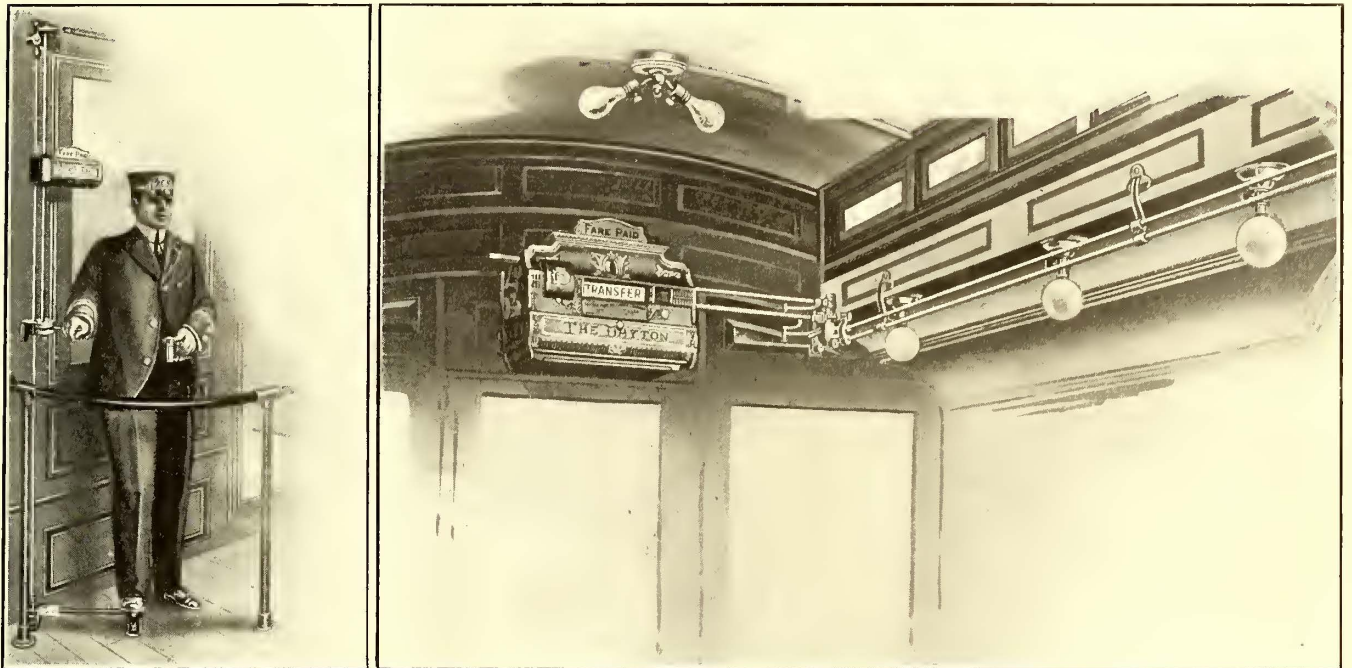
Fare Recorder in Interior of Ordinary Type of Car

When the car is returned to the car house at the end of the day's work an inspector, or register clerk, obtains access to the accumulating mechanism by means of a key, operates the printing mechanism of the recorder and obtains a "total rec-

ord" of the earnings and traffic of the car for the entire day, regardless of the number of conductors that operated the car during the day or the number of trips made. These daily "total records" are described as "auditor's total records," as they are sent by the inspector direct to the accounting depart-

operation, so that duplicate records showing the earnings and traffic of each car can be furnished direct from the recorders at the end of a day's work to any departments or officials desiring them.

The completeness with which the recorders compute and record



Views of Platform and Interior of Regular Prepayment Car Showing Setting and Operating Mechanism and Fare Indicator on Platform and Recorder Inside the Car

THE INTERNATIONAL RAILWAY COMPANY										BUFFALO, N. Y.		DATE JAN 9	
TOTAL RECORD										RECORDER		INSPECTOR	
LINE	TRIPS	CASH	5c FARES	TRANSFERS	3c FARES	PASSES	TOTAL PASSENGERS	RECORDER TOTAL	INSPECTOR				
52	17	4 2 2 4	7 6 2	2 5 1	1 3 9	0 7 3	2 2 4	4 0 2 2 5	0 3 9				
TRIP RECORD										CAR No. 5143			

THE INTERNATIONAL RAILWAY COMPANY										BUFFALO, N. Y.		DATE JAN 9	
TOTAL RECORD										RECORDER		INSPECTOR	
LINE	TRIPS	CASH	5c FARES	TRANSFERS	3c FARES	PASSES	TOTAL PASSENGERS	RECORDER TOTAL	INSPECTOR				
52	5	0 9 7 5	1 8 3	0 7 0	0 2 0	0 1 7	2 9 0	4 0 2 2 5	0 0 9				
TRIP RECORD										CAR No. 5143			
1 31 AM		0 0 9 0	1 8	0 8	0 0	0 2	0 2 8			COND 1940			
12 15 AM		0 1 3 6	2 6	1 2	0 2	0 4	0 4 4			COND 1940			
11 01 PM		0 2 0 6	4 0	1 2	0 2	0 4	0 5 8			COND 1940			
9 45 PM		0 3 4 4	6 4	2 0	0 8	0 2	0 9 4			COND 1940			
8 32 PM		0 1 9 3	3 5	1 8	0 8	0 5	0 6 6			COND 1940			

THE INTERNATIONAL RAILWAY COMPANY										BUFFALO, N. Y.		DATE JAN 9	
TOTAL RECORD										RECORDER		INSPECTOR	
LINE	TRIPS	CASH	5c FARES	TRANSFERS	3c FARES	PASSES	TOTAL PASSENGERS	RECORDER TOTAL	INSPECTOR				
52	6	1 8 5 6	3 3 1	0 9 7	0 6 7	0 2 4	5 1 9	3 9 9 3 5	0 0 0				
TRIP RECORD										CAR No. 5143			
7 15 PM		0 2 9 9	5 5	1 0	0 8	0 6	0 7 9			COND 2378			
6 02 PM		0 3 5 3	6 4	2 0	1 1	0 5	1 0 0			COND 2378			
4 45 PM		0 2 0 3	4 3	1 4	1 6	0 2	0 7 5			COND 2378			
3 31 PM		0 3 3 1	5 9	1 5	1 2	0 5	0 9 1			COND 2378			
2 15 PM		0 2 4 0	4 5	1 7	0 8	0 2	0 7 2			COND 2378			
1 02 PM		0 3 6 1	6 5	2 1	1 2	0 4	1 0 2			COND 2378			

THE INTERNATIONAL RAILWAY COMPANY										BUFFALO, N. Y.		DATE JAN 9	
TOTAL RECORD										RECORDER		INSPECTOR	
LINE	TRIPS	CASH	5c FARES	TRANSFERS	3c FARES	PASSES	TOTAL PASSENGERS	RECORDER TOTAL	INSPECTOR				
52	6	1 3 9 3	2 4 8	0 8 4	0 5 1	0 3 2	4 1 5	3 9 4 1 6	0 0 0				
TRIP RECORD										CAR No. 5143			
11 45 AM		0 3 5 0	0 1	1 0	1 5	0 6	0 9 2			COND 259			
10 30 AM		0 2 2 1	3 7	1 5	1 2	0 4	0 6 8			COND 259			
9 15 AM		0 2 5 4	4 6	2 5	0 8	0 4	0 8 3			COND 259			
8 01 AM		0 2 3 8	4 4	1 2	0 6	0 8	0 7 0			COND 259			
6 45 AM		0 1 8 4	3 2	1 2	0 8	0 4	0 5 6			COND 259			
5 30 AM		0 1 4 6	2 8	3 0	0 2	0 6	0 4 6			COND 259			

Sample Record Made by Recorder

ment, where the day's earnings and traffic are determined from them. Any number of these daily "total records" can be obtained from the recorders merely by repeating the printing

the earnings and traffic of cars is remarkable. The printed records as they come from the machines are analyzed statements of the day's operations which are as absolutely correct and as legible as typewritten letters. Errors in trip-sheet footings, extensions and classification of fares are positively eliminated.

The recorder produces two separate and distinct records, namely, the conductor's record and the auditor's record.

The conductor's record shows the results of each trip in detail as follows: Arrival time, amount of "cash" collected, number of each kind of fare collected, number of passengers carried and number of conductor. The trip records are totalized for each conductor, showing the following information: Line number, number of trips made, total amount of "cash" collected, total number of each kind of fares collected, total number of passengers carried, register total, date, number of car, number of recorder and name of company.

The auditor's record shows a summarized total of the earnings and traffic of the car for the day classified under the same headings as the conductor's record.

A closer analysis of the facsimile record herewith produced shows the following specific data for car No. 5143, operated Jan. 9 on line No. 52 of the International Railway Company, Buffalo, N. Y. The record for the day begins at the bottom of the sheet, showing the first trip completed at 5:30 a. m., \$1.46 cash, 28 5-cent fares, 10 transfers, two 3-cent fares, six passes, 46 passengers, conductor No. 259.

Similar results are shown for each trip made during the day. Conductor No. 259 made six trips, being relieved at 11:45 a. m. by conductor No. 2378. The "total record" for conductor No. 259 shows that he operated on line No. 52, made six trips, with the following result in fare collections: \$13.93 cash, 248 5-cent fares, 84 transfers, 51 3-cent fares, 32 passes, 415 passengers, the register total showing 39,416 at the end of his run.

Conductor No. 2378 made six trips, and was relieved at 7:15 p. m. by conductor No. 1940, who made five trips, being in charge of the car until 1:31 a. m., when the car was housed. Each conductor on leaving the car obtained a record of earn-

ings and traffic from the recorder covering his period of operation, with the results as shown in the record.

The "total record" for the day was removed from the recorder by inspector No. 39 when the car was pulled in. It shows the following total earnings and traffic of car No. 5143 for Jan. 9, operated on line No. 52—17 trips, \$42.24 cash, 762 5-cent fares, 251 transfers, 138 3-cent fares, 73 passes, 1224 passengers, 40,225 register total at the end of the day.

From the foregoing it will be seen that this recorder not only indicates and records the fare registrations, but also produces automatically a complete printed, classified, computed, totaled statement of passenger earnings and traffic ready for the conductor to use as a basis for his daily settlement with the company, and requiring no computations or verification either by the cashier or the accounting department.

The "Dayton" fare recorder is the result of years devoted to the study of fare accounting systems by Will I. Ohmer, of Dayton, Ohio. Installations of this recorder have begun on Through Route No. 15 of the Chicago Railways Company, which extends from the southwestern part of the city through the congested business district to the "Limits" car house beyond Lincoln Park. Cars with these recorders were put in operation March 5. Deliveries to other companies which have ordered the recorders will follow at an early date.

INTERURBAN LOCAL TICKET

A simple form of ticket for handling local traffic is made by Poole Brothers, Chicago, Ill. This ticket, which is reproduced in the accompanying illustration, is known as the "Drewry." Its application makes unnecessary a multiplicity of ticket forms. The separate stations are not required to have supplies of tickets bearing the names of each of the other stations, and the ticket seller is relieved from filling in with pen and ink or rubber stamp the name of the destination point, as required with blank tickets. When tickets are printed

THE OHIO ELECTRIC RAILWAY CO. (CINCINNATI-DAYTON DIVISION) GOOD FOR ONE CONTINUOUS PASSAGE From Station Stamped on Back to Station Opposite Point in Margin below... THE OHIO ELECTRIC RAILWAY CO. (CINCINNATI-DAYTON DIVISION) "DREWRY TICKET" AGENT'S STUB.—NOT GOOD FOR PASSAGE From Station Stamped on Back to Station Named in Margin above

Ticket for Thirty-one Stations

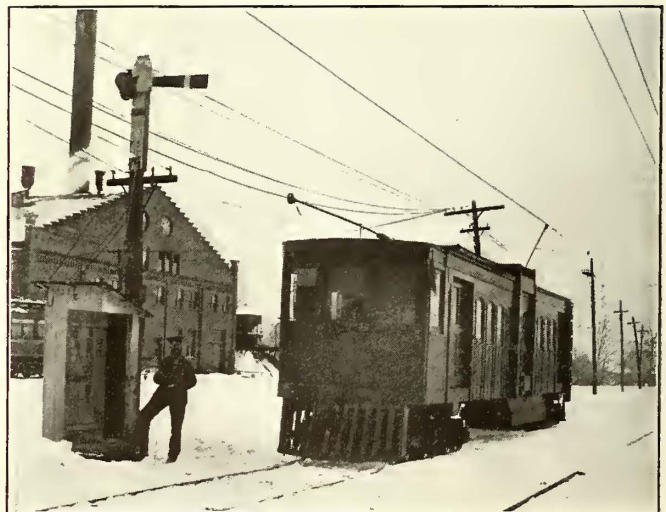
to read only to one destination considerable surplus stock must be carried. A condensed ticket which can be handled quickly, which cannot have its destination changed and which can be used in ticketing to many points is much more desirable. One form of this ticket will cover 35 or more destinations of all classes. Both the starting point and destination may be printed. Each ticket also has an agent's stub for his sales record. No writing is required on this ticket. In issuing it the strip is so cut that the destination cannot be changed. Round-trip tickets may have the same general form as one-way tickets, except that a separate return coupon is provided.

To facilitate the issuing of this ticket a cutter with a sliding blade is used. It consists of a raised plate or holder over which a supply of tickets is fitted in the proper registering position under a sliding blade. To issue a ticket it is only necessary to slide the blade to the proper destination point and tear off the ticket. The destination then is indicated by a deep notch opposite the station name, which is printed in bold-faced type on the passenger portion and in light-face type on the agent's stub. The destination thus is made positive. When a straight or first-class ticket is required only one operation of the cutter is necessary.

DISPATCHERS' SIGNALS ON STARK ELECTRIC RAILROAD

The Stark Electric Railroad operates a 30-mile, high-speed, single-track interurban line connecting Salem, Alliance and Canton, Ohio. Although there has never been an accident due to a mistake in transmitting or fulfilling a train order, the management determined to install dispatchers' signals at every siding as an extra precaution and to facilitate the movement of trains when the regular schedule becomes disarranged. The Stromberg-Carlson Telephone Manufacturing Company has recently completed the installation of these signals, which are said to be operating satisfactorily.

The signals consist of a standard semaphore arm and a two-light, double-spectacle casting which acts as a counterweight, mounted on top of a stub pole alongside of the telephone booth. Two incandescent lamps are mounted between the two sides of the spectacle casting and are connected to the trolley in series with three other lamps mounted in the telephone booth. When the semaphore arm is in a horizontal position indicating "stop" the lights show through a red spectacle and when the arm is dropped to 45 deg., indicating "clear," the lights show through a green spectacle. The absence of a light signal at night due to the burning out of any lamp is a danger indication. The semaphore arm is mechanically connected to a trip mechanism in the telephone booth which in turn is operated by a selector relay in circuit with a selector switchboard in the dispatcher's office. A single bare copper line wire connects the dispatcher's office in Alliance with all of the signal relays and current for op-



Dispatcher's Signal at Lake Park

erating the signal system is taken from the trolley at the dispatcher's office. The signal mechanism is protected by Argus lightning arresters and individual ground rods are used in preference to grounding to the rail.

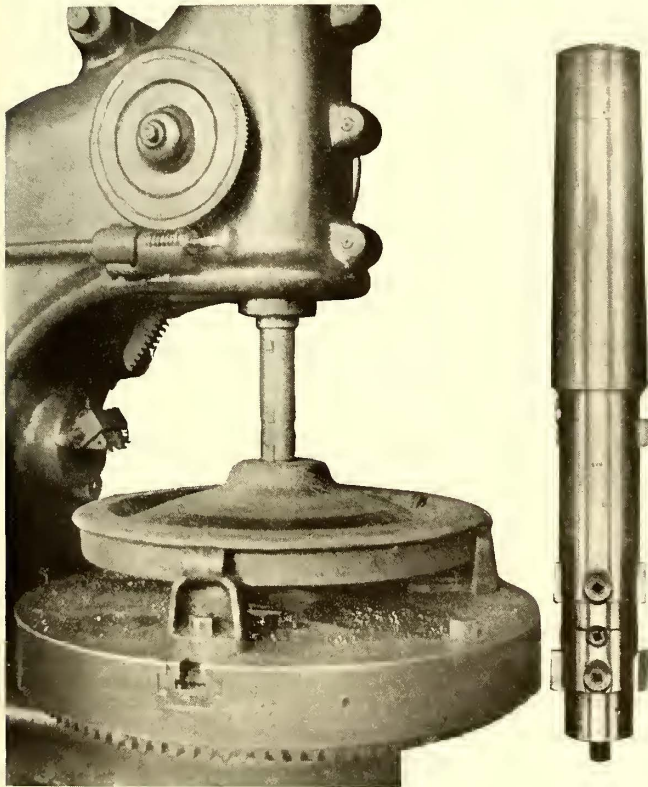
The normal position of the semaphore arms is "clear" and the cars have regular meeting points shown on the timetable, for which no train orders are issued by the dispatcher. When it is necessary to fix a new meeting point the dispatcher issues the proper orders to the crews of both cars affected and then sets the signal at the new meeting point to "stop" by energizing the selector relay at that siding and causing the trip to re-

lease the signal arm. The crew of the first car to arrive reports to the dispatcher by telephone and is warned to wait for the opposing car, and as soon as the first car is on the siding the signal arm is restored to "clear" on orders from the dispatcher by one of the crew, who pulls the arm down and resets the trip. When the arm is set to "danger" by releasing the trip through the selector relay a series of impulses is sent back to the dispatcher's office and is recorded on a tape of paper, in the form of perforations. Each signal gives a different number of impulses so that the "answer back" indication for each is distinctive. It is not possible to receive the "answer-back" signal unless the semaphore arm has moved to the full "stop" position. The record tape affords an accurate and convenient check on the dispatcher's train order sheet.

EXPANSION BORING TOOL IN NEW YORK AND VICINITY

Several of the electric railways in and about New York have installed Davis expansion car wheel boring tools. The accompanying cut shows the application of this tool in one of these shops to a Putnam lathe for borers ranging from 3 in. to 4½ in. in diameter. One of the companies which have been using this tool for some time states that it greatly increases the output of the boring mill. The same company also uses the expansion boring bar for boring bearings 2½-in. x 3¼-in. bore.

Not more than 20 seconds are required to adjust the tool to bore the wheels for the axles. A perfect hydraulic fit is attained by means of a micrometer caliper. The expansion boring tool shown in the accompanying illustration is intended for use on steel wheels. It carries two sets of cut-



Expansion Boring Tool for Steel Wheels

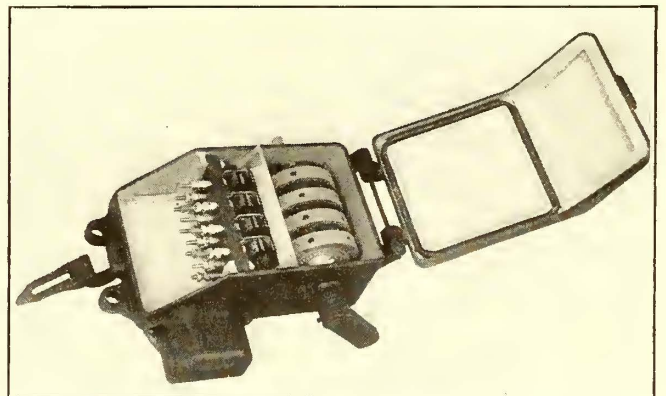
ters at the bottom and a single cutter at the top. The lower set is for rough boring, the upper set for finished boring and the single top cutter for chamfering. The top cutter, which chamfers the hole immediately after the roughing cutters have passed through the wheel, prevents the wheel from cutting the axle when being pressed through. The chamfering cutter is removed from the tool while the finishing cutters are passing through the wheel. These tools are made by the Matthews-Davis Tool Company, St. Louis, Mo.

COMBINED ACCELEROMETER AND GRADIENT METER

A brief description of the Trotter accelerometer and gradient meter was published in the *ELECTRIC RAILWAY JOURNAL* for Nov. 5, 1910, page 962. The American rights to this device have recently been acquired by Wonham, Sanger & Bates, New York. The Trotter accelerometer consists of a curved glass tube completely filled with a special liquid except for a small air bubble which bears a definite relation to the diameter of the tube. A graduated scale is marked on the tube and by the position assumed by the air bubble the acceleration or retardation of the vehicle on which the device is mounted may be read directly in terms of feet per second or any other convenient unit of measurement. The tube is inclosed in a small metal case which can be carried in the pocket, and a special adjustable bracket for mounting the tube on the dashboard of a car is supplied. It is only necessary to adjust the tube so that it is parallel with the center line of the car and so that the air bubble rests under the zero graduation when the car is at rest on level track. As soon as the car accelerates the bubble moves to one side just as a pendulum would swing and the distance through which it moves as indicated by the scale is proportional to the rate of change of velocity of the car. The retardation due to braking also may be read directly. Some of the other tests which may be made with reasonable accuracy with this simple device are measurement of retardation due to wind or rail resistance, measurement of brake horse-power of motors at various speeds under actual running conditions and measurement of grades on which the car may be running.

UNIVERSAL SWITCH BOX

The General Railway Signal Company, Rochester, N. Y., has designed a type of mechanical circuit-breaker, or switch box, which can be adapted to a wide variety of uses in railway signal installations, including shunting or breaking track circuits, opening line circuits or selecting circuits in interlockings. It consists of a connection board, four normal and four reverse contacts and four adjustable cams mounted on a shaft. When the shaft is revolved the cams bear against the contacts and force them open or closed. All of these parts are mounted in a weatherproof iron case which has a gasketed cover, held in place with a cam lever and padlock to insure tight closure. A supplementary cover over the contact compartment is provided



Universal Switch Box

to protect the contacts from frost and condensation and from rain when the main cover is open. The wire inlet may be placed on either side of the box and is arranged to receive and hold rigidly in place either trunking or conduit. The operating crank on the cam shaft also may be attached on either side of the box. A centering mechanism which will automatically revolve the cam shaft and open all circuits if the operating rod becomes disconnected can also be provided. This type of switch box is designated by the makers as model 5, form A.

News of Electric Railways

Meeting of Illinois Electric Railways Association

The next meeting of the Illinois Electric Railways Association will be held at Bloomington, Ill., on March 17, 1911, and the program will include the discussion of affairs chiefly of interest to the electric railways in Illinois.

C. E. Flenner, Wheaton, Ill., secretary of the association, advises that the principal feature of the meeting will be the discussion of reports of committees, including a report of the traffic committee on the feasibility of establishing a union ticket office and information bureau in Chicago for interurban electric railways in Illinois. As reported in the *ELECTRIC RAILWAY JOURNAL* of Feb. 25, 1911, page 338, a representative committee was appointed to investigate and report on the possibilities of such a joint office and information bureau. The discussion of this subject, which is an important one, especially to those roads reaching Chicago, will no doubt hold the interest of the association during the larger part of the meeting. The courtesy of a special train over the Illinois Traction System has been extended to the association by H. E. Chubbuck, vice-president executive of that company.

Program of Central Electric Accounting Conference

The following program has been announced for the meeting of the Central Electric Accounting Conference which is to be held at the rooms of the Springfield Commercial Club, Springfield, Ohio, on March 11, 1911:

MORNING SESSION, 9:00 A. M.

Meeting of the executive committee, Hotel Arcade.

Regular business session and reports of the following committees: Uniform comparative statistics, membership committee, constitution and by-laws committee, special committees.

Paper, "The Traveling Auditor," by A. J. White, traveling auditor of the Ohio Electric Railway.

Discussion.

AFTERNOON SESSION, 1:30 P. M.

Paper, "Method of Accounting of Freight Claims," by O. I. Davis, local auditor of the Dayton, Covington & Piqua Traction Company.

Discussion.

General discussion of the subject "Inter-Department Charges."

Program of Meeting of New York Association

The thirteenth quarterly meeting of the Street Railway Association of the State of New York will be held at the Hotel Onondaga, at Syracuse, N. Y., on the evening of March 21, 1911, and on March 22, 1911. The session on Tuesday evening will be opened with an informal dinner at 8 o'clock at the Hotel Onondaga, after which the remainder of the evening will be given to a general discussion of one of the subjects on the program. The following program will be carried out:

Paper, "Joint Use of Poles," by W. J. Harvie, chief engineer of the Utica & Mohawk Valley Railway, Utica, N. Y.

Discussion by B. Penoyer, engineer maintenance of way of the Schenectady Railway, Schenectady, N. Y.; C. S. Stanton, electrical engineer of the Otsego & Herkimer Railroad, Hartwick, N. Y.; C. L. Cadle, chief engineer of the New York State Railways, Rochester, N. Y., and R. P. Leavitt, chief engineer of the Albany Southern Railroad, Albany, N. Y.

Paper, "Adoption of Interurban Rules," by J. K. Choate, general manager of the Otsego & Herkimer Railroad, Hartwick, N. Y.

Discussion by J. C. Calisch, vice-president and general manager of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., and W. H. Collins, general manager of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.

Paper, "Economical Limit for Flange Wear on Steel Tired and Rolled Steel Wheels," by John Sibbald, master

mechanic of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.

Discussion by G. M. Cameron, master mechanic of the New York State Railways, Rochester, N. Y., and F. J. Doyle, master mechanic of the Schenectady Railway, Schenectady, N. Y.

Paper, "Building Up of Interurban Territory and Best Method of Stimulating Summer Traffic," by R. H. Smith, general manager of the Albany Southern Railroad, Albany, N. Y.

Discussion by C. E. Holmes, assistant general passenger agent of the Otsego & Herkimer Railroad, Hartwick, N. Y., and R. M. Colt, general passenger agent of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.

Paper, "Operation of Ohmer Fare Register in City Service," by John E. Duffy, superintendent of the Syracuse Rapid Transit Railway, Syracuse, N. Y.

Arrangements have been made with the Hotel Onondaga for accommodations for those who apply direct to the hotel management prior to the date of the meeting.

Rapid Transit Proposal from Brooklyn Rapid Transit Company

On March 2, 1911, the Brooklyn Rapid Transit Company addressed to the Public Service Commission of the First District of New York a second proposal for the construction of rapid transit subway and elevated lines in the Boroughs of Brooklyn, Manhattan and Richmond which calls for 23 miles of new subways, 9.35 miles of new elevated extensions, 9.16 miles of elevated third tracks and 18.25 miles of new elevated lines to supplant old steam railroads. A total expenditure of \$90,000,000 is proposed according to the program of the company, of which \$40,000,000 would be spent by the city and \$50,000,000 by the company.

A summary of the company's proposal as it affects Brooklyn follows: To equip and operate the Fourth Avenue subway, connecting it with the Third Avenue Elevated, to be extended to Fort Hamilton, with a proposed four-track elevated on New Utrecht Avenue from Thirty-ninth to Sixty-second Street and a two-track line from there over the West End route to Coney Island; a three-track elevated to take the place of the old Sea Beach line from Sixty-second Street to Coney Island, and a double-track elevated to take the place of the present Culver line from Tenth Avenue and New Utrecht Avenue to Coney Island, including the elimination of grade crossings on these old steam roads. A tunnel under New York Bay connecting the Fourth Avenue subway with Richmond, from about Thirty-ninth Street, Brooklyn. A four-track subway under Flatbush Avenue from the Fourth Avenue subway to Prospect Park Circle, separating there into two branches, one a two-track road under Flatbush Avenue to the Brighton Beach line, which is a four-track road; the other a two-track road under Eastern Parkway to Pitkin Avenue, rising to a two-track elevated connection with the Kings County elevated road at Snediker Avenue. An extension of the Kings County Elevated Railroad from the old city line through Queens to Jamaica as a two-track road. Third-tracking the Fulton Street elevated line from the Brooklyn Bridge to East New York. Third-tracking the Broadway elevated from Williamsburg Bridge to East New York. A connection between the Myrtle Avenue and the Broadway elevated lines, and a third track on the Myrtle Avenue line from Broadway and Myrtle Avenue to Ridgewood. The elevation of the Lutheran Cemetery line from Ridgewood to Fresh Pond Road, to be a three-track line. A new elevated loop line from the Williamsburg Bridge through Grand Street, Leonard Street, Manhattan Avenue, across Newtown Creek into Queens and through Jackson Avenue to the Queensboro Bridge to a connection with a proposed line in Manhattan contained in the offer.

A summary of the company's proposal as it affects Manhattan follows: The construction of a subway under Church Street, Vesey Street, Broadway, Seventh Avenue to Fifty-ninth Street, east to the Queensboro Bridge; to be four

tracks from City Hall to Fifty-ninth, two tracks in that street to the Queensboro Bridge, and partly three and partly two tracks south of City Hall to the Battery. Connection of the Williamsburg Bridge by way of Delancey and Spring Streets with the proposed Broadway subway. Connection, grade permitting, between the proposed Broadway subway and the Brooklyn Bridge. An extension of the Centre Street subway with two tracks under Nassau, Broad and Beaver Streets to the Battery, connecting with the Church Street-Broadway line proposed. A new tunnel connecting the Church Street-Broadway and the Nassau-Beaver Street extension from Centre Street, running under the East River from the Battery to Montague Street, thence under Fulton and Willoughby Streets to a connection with the Fourth Avenue subway at Willoughby Street on the extension of Flatbush Avenue. The use of the Centre Street subway to the extent that it may offer terminal and connection facilities, particularly with reference to traffic over the three bridges and as part of the Nassau-Beaver Street subway extension. The Broadway-Lafayette Avenue section of the Centre Street loop is eliminated from the Brooklyn Rapid Transit Company's offer, the company regarding this as an undesirable route.

In regard to financing the proposal President Williams of the company said:

"It is our suggestion that the city should construct the subways and that we should equip and operate them upon such terms and for such period as may be agreed upon, in connection with our existing and proposed elevated railroads. We should expect the city also to assume, as heretofore, its reasonable share of the cost of eliminating crossings of streets at grade over the lines of the former steam railroads. The estimated expense to which the company would be subjected for carrying out its part of the above plan is between \$50,000,000 and \$60,000,000. The cost to the city, in addition to what has already been contracted for, would probably not exceed the amount to which the city would morally (if not legally) commit itself by the promised extensions in Brooklyn of subways now under construction and others covered by the Interborough Rapid Transit Company's offer."

The Public Service Commission has announced the tentative elevated and subway routes, which if built will afford to Queens Borough and some suburban sections of Long Island more important rapid transit facilities. These lines of transit as outlined by the commission are as follows: Subway or elevated road connecting the terminus of the Steinway tunnels with the Queensboro Bridge Plaza, through Van Alston and Jackson Avenues, or through Van Alston Avenue and private property adjoining the Sunnyside yards. Elevated road from the Queensboro Bridge Plaza, across the Sunnyside yards to Thomson Avenue, to Hoffman Boulevard, to Jamaica Avenue. The route completed would be the longest elevated road in the city. It is designed to serve people living in Queens, Hollis, Springfield and adjoining towns. Elevated road from the corner of Thomson and Greenpoint Avenues to Roosevelt Avenue, to Flushing Creek. This road will serve Flushing, Elmhurst and adjoining towns. Subway and elevated road, by tube from the Queensboro Bridge Plaza through Jackson Avenue to Debevoise Avenue and by elevated to Ditmars Avenue to North Beach. The commission set March 8, 1911, as the date for a hearing on the subject.

Report of Pennsylvania Railroad on New York Terminal Electrification Work

James McCrea, president of the Pennsylvania Railroad, made the following references to the electrification work of the company at New York in the annual report of the company dated March 3, 1911:

"The Newark Rapid Transit Line, consisting of the electrification of the present tracks of the New York division from a connection with the Hudson & Manhattan Railroad, near Summit Avenue, Jersey City, to Manhattan Transfer, and a branch from there to a station in Park Place, Newark, was begun during the year and will no doubt be completed by the close of the summer of 1911. This will provide a through downtown rapid transit tunnel route into New York City and additional passenger facilities in the center of Newark, thereby materially reliev-

ing the congested conditions at Market Street Station in the latter city, where the necessary improvements of the existing facilities will be undertaken when the co-operation of the city authorities has been obtained.

"The New York tunnel extension was practically completed during the year, and on Sept. 10, 1910, the East River division, extending from Pennsylvania Station, New York, into Long Island, was opened for the operation of Long Island Railroad trains under trackage rights granted by your company and the Pennsylvania Tunnel & Terminal Railroad. The opening of the western portion of the extension from the station under the North River to Harrison (Manhattan Transfer), N. J., was completed and opened for traffic on Nov. 27, 1910, from which date the entire tunnel extension from that point to a connection with the Long Island Railroad at Sunnyside yard has been successfully operated by your company as agent for the Pennsylvania Tunnel & Terminal Railroad, the corporation under whose powers this extension was constructed for your system.

"It is evident that no extraordinary terminal development of this character can of itself be profitable if solely dependent on the passenger rates which can be charged for the short mileage operated, and it naturally follows that your company as owner will pay any deficit arising from its operation, because it was constructed primarily for the use and benefit of the entire Pennsylvania Railroad system as an entrance into and through New York City and Long Island.

"The New York tunnel extension is carried on your books at \$55,565,415.53, of which \$15,000,000 is represented by full paid capital stock of the Pennsylvania Tunnel & Terminal Railroad and the remainder by advances. The total cost of this extension to Dec. 31, 1910, including real estate not permanently required for its use and conservatively estimated to be worth between \$7,000,000 and \$8,000,000, and not yet disposed of, is \$112,965,415.52, of which \$47,400,000 has been charged against net income and profit and loss, and, as explained in previous reports, \$10,000,000 has been borne by the Pennsylvania Company and charged against its profit and loss account."

Chamber of Commerce Inquiry into Operating Conditions in Cleveland

The Cleveland Chamber of Commerce on March 2, 1911, selected a special committee of 10 members to inquire into the conditions surrounding the operations of the Cleveland Railway with particular reference to the changes in the terms necessary to enable the company to give adequate service. Particular attention will be given to the request of the company for such changes as will enable it to secure funds at the lowest interest rate and the request to amortize the discounts necessary on bond sales. The names of the members of the committee follow: F. H. Goff, president of the Cleveland Trust Company and representative of the Cleveland Railway in the Goff-Johnson negotiations, chairman; Warren S. Hayden, Hayden, Miller & Company, bonds and securities; George B. Siddall, Homer H. McKeehan, James R. Garfield and D. C. Westenhaver, attorneys; Charles E. Adams, manager of the Cleveland Hardware Company; Henry W. Stecher, secretary and treasurer of the Pearl Street Savings & Trust Company; H. A. Higgins, general manager of the Standard Tool Company, and Warren S. Stone, president of the Brotherhood of Locomotive Engineers. Mr. Westenhaver was the attorney for the Low-Fare Railway and was connected with the administration of street railway affairs under the Johnson régime for several years.

At the first meeting of the committee, on March 4, 1911, Chairman Goff stated that all sessions would be open to the public and that suggestions would be welcomed. D. C. Westenhaver was made vice-chairman of the committee and Hudson Havens secretary. The Cleveland Railway was represented by J. J. Stanley, president, and Andrew Squire and Harry Crawford, attorneys; the city by City Solicitor Baker and G. H. Dahl, street railway commissioner.

Mr. Goff said that the committee would inquire into conditions and determine if any amendments could be suggested to the Tayler franchise to make operation successful at a fare of 3 cents plus 1 cent for a transfer, or as low a rate as is consistent with the proper upkeep of the property,

interest requirements and service of the character to which the public is entitled. The committee has decided to invite Mayor Herman Baehr, former Mayor Tom L. Johnson, Chairman Hitchins of the street railway committee of the City Council, A. B. DuPont, Newton D. Baker, G. H. Dahl and Warren S. Bicknell, former receiver of the Municipal Traction Company, to attend the meetings. Each of these men will be asked to state what he considers necessary to make the plan a success and each will be permitted to question the others. These statements and questions will relate to the main points under inquiry by the committee: "What defects exist in the Tayler grant?" "What amendments ought to be made to insure its success?" "Has the company done its utmost to make the operation of the Tayler grant a success?"

The company will be asked for a statement showing expenses incurred for extensions and betterments since 1900; the amount spent for operation under the Tayler franchise, with figures showing whether the reduction has stimulated travel and whether it has imposed burdens upon the company for greater facilities; the average rate of fare, with and without transfers; expenses of renewal and maintenance since the road has been operated under the Tayler franchise and, if the amount was in excess of the allowance, the reason therefor. Attorney Squire for the company stated that all the information which the company possessed would be furnished. The difficulty was that the company could not dispose of stock to provide funds for its needs. The company would be willing to point out defects in the grant, but doubted whether it would be willing to suggest remedies.

Mr. Baker believed that the only sure remedy was municipal ownership. When the speculative phase of street railway business was removed capital would lose interest. In other countries where plans similar to this had been tried with railroads the governments had finally found it necessary to finance the undertakings. He thought, however, that the grant might be patched up temporarily until cities were given the right to operate street railways.

Harris, Forbes & Company, New York, N. Y., advertised on March 8, 1911, an issue of \$5,000,000 of 3 per cent first mortgage gold bonds of the Cleveland Railway at 100 and interest. The bonds are dated March 1, 1911, and are due March 1, 1931, and the interest is payable March 1 and September 1 in New York or Cleveland. The bonds are of the denomination of \$1,000 and are subject to redemption at any interest date at 105. The Citizens' Savings & Trust Company, Cleveland, Ohio, and the Bankers' Trust Company, New York, N. Y., are trustees of the issue. In advertising the bonds the following statement of earnings and expenses for the year ended Dec. 31, 1910, was made: Gross earnings, \$6,160,378; expenses, taxes and reserve for maintenance, \$4,738,266; net earnings, \$1,422,111; annual bond interest, \$500,000; surplus, \$922,111. The statement was made that the City of Cleveland has recently granted the company a new 25-year franchise which provides for an automatic adjustment of the rate of fare so that in addition to fixed charges the company may pay 6 per cent dividends on the present capital stock of \$15,069,500 and all the stock hereafter issued under the limitations of the franchise. The first mortgage 5 per cent gold bonds are secured through the deposit of first mortgage bonds, by a first lien on an important part of the property and by direct lien on the entire remaining property of the company, subject to the \$500,000 of bonds of the Cleveland Electric Railway which mature on March 1, 1913. The advertisement also carried a statement addressed to the holders of the consolidated mortgage 5 per cent bonds of the Cleveland Electric Railway, due March 1, 1913, in which an offer was made to exchange these bonds on even terms for bonds of the new issue.

Several conferences have been held by Mayor Baehr, Commissioner Dahl, Chairman Hitchins of the Council committee on street railways, and others relative to the requests of the company for changes in the franchise that will allow it to finance its needs. The city officials seem disposed to allow the amortization of the discount on bonds which are sold to take care of the indebtedness of the company and refunding bonds which will soon be due. It is further said that the administration may agree to a change that will make the price of the property its capital value

instead of the appraised value in case the city should decide to take it over by purchase.

A statement of operation for January, 1911, which shows both the ordinance allowances and the actual expenditures follows:

	Allowances.	Actual Expenditures.
Gross receipts.....	\$504,649	\$504,649
Maintenance.....	\$88,556	\$93,313
Operating expenses.....	254,599	279,738
	<u>343,155</u>	<u>373,051</u>
Net income.....	\$161,494	\$131,598
Other income.....	3,328	3,328
Total income.....	<u>\$164,822</u>	<u>\$134,926</u>
Taxes.....	\$31,453	\$31,453
Interest.....	115,337	115,337
	<u>146,790</u>	<u>146,790</u>
Surplus.....	\$18,032	*\$11,864

*Deficit.

There is a deficit of \$25,139 in the operating account and of \$4,757 in the maintenance account, making \$29,896 in both. Deducting the surplus of \$18,032 on the franchise allowance, there is an actual deficit of \$11,864. The actual deficit in the operating fund for the first five months of the second adjustment period is approximately \$89,000.

Electrifying New Haven's Harlem River Branch.—Work has just been started on the electrification of the Harlem River branch of the New York, New Haven & Hartford Railroad, from New Rochelle along the shore of Long Island Sound to the Harlem River.

Electric Night at Railroad Club.—The New York Railroad Club will meet at the building of the United Engineering Societies in New York on the evening of March 17, 1911, at 8 o'clock. The committee on electrification, which expected to make a formal report, has decided that the report made a year ago represents the situation up to date and that anything further it might present now would not contain anything of particular interest in connection with the subject of electrification. The committee has, however, arranged for short addresses by a number of recognized experts and authorities, including Prof. George F. Swain, Samuel M. Vauclain, of the Baldwin Locomotive Works; C. L. Bardo, superintendent of the electric division of the New York Central & Hudson River Railroad; H. Gilliam, electrical superintendent of the New York, New Haven & Hartford Railroad, and William McClellan. Special invitations to attend the meeting have also been extended to J. R. C. Armstrong, H. G. Scott, W. B. Potter, A. H. Armstrong, L. B. Stillwell, W. S. Murray, E. W. Rice, Thomas F. Mullaney and Frank J. Sprague.

Southern Pacific Development at Los Angeles.—R. S. Lovett, president of the Southern Pacific Company, has recently been in conference in Los Angeles with Paul Shoup, manager of the company's electric railways in California, and other officers of the Southern Pacific company and the electric railways which it controls, in regard to developments near Los Angeles. One of the most important improvements contemplated is the construction of a terminal in Los Angeles to cost \$2,000,000. It is generally understood that the program for the further development of the electric railways will provide, first, the extension of the lines of the Pacific Electric Railway and Los Angeles lines of the Pacific Railway in the San Fernando Valley; second, the extension of the lines of the Pacific Electric Railway eastward from their present eastern limit into San Bernardino with lateral feeders to tap the various populous foothill cities and towns along the way; third, the development of the electric railways of the Southern Pacific Company in the vicinity of San Bernardino, Riverside and Redlands into an interurban system that will link these towns and be connected with Los Angeles by the extension to San Bernardino.

Seattle Railway Case Reversed on Appeal.—On Feb. 7, 1911, in San Francisco, the United States Circuit Court of Appeals handed down a decision in the matter of the appeal of the Seattle Electric Company against the Seattle, Renton & Southern Railway. According to the facts set forth in the decision the Seattle, Renton & Southern Railway operated a street railway in Seattle, Rainier Avenue being one of the principal streets on which the company operated,

under a franchise from the city. Under another franchise the Seattle Electric Company was granted the right to operate a railway over certain rights-of-way adjacent to Rainier Avenue. The Seattle, Renton & Southern Railway applied to the United States Circuit Court for a restraining order to prevent the Seattle Electric Company from building the line for which it had obtained permission from the city. It alleged that the operation of the new road would hamper, obstruct and render inefficient its road; that its earnings would be greatly reduced and the cost of operation greatly increased. The United States Circuit Court granted an interlocutory order restraining the Seattle Electric Company from constructing its line and from this order the company appealed. The decision holds that the Seattle Electric Company had a right to occupy Rainier Avenue, on the ground that a street railway franchise is not exclusive. The city, under its charter, has a right to construct and operate street car lines over its streets and to grant others the privilege of constructing and operating railways over them. The ordinance is not in conflict with the Constitution of the United States and the Seattle, Renton & Southern Railway erected its lines subject to the right of the city to grant to another a franchise under which it would be authorized to operate a street railway over the streets occupied by the Seattle, Renton & Southern Railway. The decision by the United States Circuit Court of Appeals says that the Circuit Court had no jurisdiction in the matter and reverses the judgment of injunction, with instructions to dismiss the case.

LEGISLATION AFFECTING ELECTRIC RAILWAYS CONNECTICUT

A hearing was given by the judiciary committee on Feb. 28, 1911, on the bill which has been suggested by C. S. Mellen, president of the New York, New Haven & Hartford Railroad, to create a court of commerce to have jurisdiction over the affairs of the public service corporations. This bill was referred to in the *ELECTRIC RAILWAY JOURNAL* of Feb. 11, 1911, as a substitute for the proposed new utilities commissions, and its purpose was briefly defined at that time. At the hearing on Feb. 28 Mr. Mellen said that the reasonableness of a rate was a question to be determined by the courts. Unnecessary publicity of corporation affairs would defeat important development of a property by acquainting others with a company's plans. Future developments depended on the chance of the investor to realize profits commensurate with the hazard involved in making the investment. Mr. Mellen said that an investigation of an accident by a State was not productive of good results. The lighting properties controlled by the New York, New Haven & Hartford Railroad were a heritage from some of the electric railways which the company had taken over, and would be disposed of at a fair price.

A hearing was held on Feb. 23 on the bill to prohibit the loading and unloading of express cars by street railways in congested centers. Lucius F. Robinson, for the Connecticut Company, and H. B. Freeman, for the Hartford & Springfield Street Railway, both opposed the bill on the ground that a general law should not be passed to cover a condition peculiar only to Norwich. The bill calling for destination signs, 6 in. high, on the front of street cars, was also opposed by Mr. Robinson and Mr. Freeman, and J. K. Punderford, general manager of the Connecticut company. It was held that this matter was administrative. The bill to require electric railways to file with the Railroad Commission the details of accidents within a week after they have happened was opposed by the electric railway interests on the ground that such a measure would benefit ambulance chasers. Mr. Punderford opposed the bill introduced to require electric railways to heat the vestibules of their cars. He said that the employees of the Connecticut Company had never complained to him about cold vestibules. Both Mr. Punderford and Mr. Robinson opposed the bill to require a motorman to turn off the searchlight of a car when approaching a vehicle under penalty of a fine of not more than \$50 for failure to comply with the law. A bulletin was posted by the Connecticut Company in September, 1910, instructing motormen to turn off the arc light and turn on the incandescent light when approaching automobiles. Later this rule was amended to cover teams. Mr. Punderford

cited places where motormen were ordered to cover distances with arc lights out for safety. He contended that the lights on the cars were no stronger than those on many automobiles.

IOWA

A joint meeting of the committee on judiciary and corporations of the Iowa Senate and the committees on railroads and municipal corporations of the House was held recently to consider public utility measures. J. H. Roemer, a member of the Railroad Commission of Wisconsin, explained what had been accomplished in his State under the utilities law in force there. Following Mr. Roemer, Jonathan W. Brown, Sioux City, opposed the measures under consideration, and particularly the Sammis bill. J. K. Welch, city attorney of Knoxville, stated, in effect, that Knoxville favored the adoption of what is known as the Wisconsin law, but argued that the Sammis bill differed materially from it. Mayor Hanna, of Des Moines, favored a general utilities commission provided the law creating it was so framed as to protect all the interests concerned. He offered no special criticism of any particular bill. John R. Lane, Davenport, made the concluding address. He analyzed the several utility measures.

MAINE

A summary of the legislation in Maine for February, the second month of the session, in matters likely to affect electric railways, follows: Signed by the governor—Ratification to Atlantic Shore Railway of charter rights of Atlantic Shore Line Railway, in accordance with receivers' sale last December; ratification of action of Presque Isle in subscribing for bonds of Aroostook Valley Electric Railway; bill to allow the Waterville, Wiscasset & Farmington Railroad, a narrow-gauge steam line, to discontinue its track between Weeks' Mills and Winslow on account of competition of Lewiston, Augusta & Waterville Electric Railway, and an alternative bill to revive the charter of the Waterville & Winslow Bridge Company; bill to renew and extend for two years charters of Northern Aroostook Electric Company and Central Aroostook Electric Company, both with rights to sell to electric railroads; bill to allow York Light & Heat Company, of Biddeford, to furnish power to electric railroads; bill to charter Maine Power Company at Orono.

The following measures have been reported favorably from committee, with no apparent opposition in legislature: Charter renewal for Cape Elizabeth & Scarborough Electric Railway; change of name of Belfast & Liberty Electric Railway to Belfast & Augusta Electric Railway, with power to sell electricity where other companies do not enjoy proscriptive rights; charter renewals for Lubec, East Machias & Machias Electric Railway, Winter Harbor & Eastern Electric Railway, Jonesport Central Electric Railway, Fairfield & Skowhegan Electric Railway, Mt. Desert Transit Company, of Bar Harbor; Bridgton Street Railway, Eastport Street Railway. The following measures have been reported from committee, "ought not to pass," and this report has been accepted by the Legislature: To authorize the Rockland, South Thomaston & St. George Electric Railway to transport freight and chattels; to authorize the same company to build its own lines into Rockland.

The bills before committee which have not yet been acted upon follow: To charter the Portland Terminal Company, to take over property of Union Station Company, now owned by Boston & Maine Railroad and Maine & Central Railroad, with power of eminent domain to enlarge its property and with right to acquire and operate electric railways; to permit municipal authorities to regulate street railway service, subject to appeal to the Railroad Commission; to charter Farmington & Augusta Railroad to build an electric railway or steam railroad between the two places; to charter the Skowhegan & Athens Electric Railway; to charter the Knox County Central Electric Railway to build from Friendship via Union to Belfast. An important general bill which has been reported "ought to pass" is an amendment to the employers' liability law making it proof of negligence of employer if it can be shown that he was notified of a defect in machinery or appliances, and making the employer responsible for the acts of the em-

ployee who is a fellow servant of the party injured or killed. Senator Carl E. Milliken has served notice of an amendment to all electric power and railway charters to forbid taking power out of the State. This action is not opposed. The Aroostook Valley Electric Railway asks for charters to build from Washburn to Caribou to New Sweden, and west to the Quebec line, and to take over and electrify the Presque Isle branch of the Canadian Pacific Railway. The bill to include all electric railways in the general law forbidding the transmission of power from the State is still before the legal affairs committee. A bill, favorably reported, would empower municipal officers to compel street railways to change locations to other parts of the public way, subject to appeal to the Railroad Commission.

The hearing on the public utilities bill was held on March 2 before the committee on legal affairs. Henry Hudson attacked the measure as unnecessary and creating needless expense. George M. Hanson, recent Democratic nominee for Congress, asked that it be amended to permit free competition in the sale of electricity in amounts exceeding 100,000 kw-hours per year, to forbid the erection of additional poles in public ways without the consent of municipal officers, to permit appeal from municipal officers to the commission for final decision, and to compel companies to permit other companies to use their poles and wires subject to regulations and rentals fixed by the commission. Lewis A. Goudy favored the rate regulation clauses, as they would obviate the difficulties in his city, where competition had effected a saving of more than \$250,000 to the city. Charles F. Johnson, United States Senator-elect, who helped draft the bill, spoke in its favor. William M. Bradley objected to investigations being made by agents of the commission instead of the commission itself. M. B. Jones, representing the New England Telephone & Telegraph Company, thought that the bill was too drastic and offered many amendments. Harvey D. Eaton, representing the Central Maine Power Company, said that his company would welcome the regulation which was objected to by Mr. Hanson. Seth L. Carter, general counsel for the Maine Central Railroad, and Herbert M. Heath, counsel for a number of electric railways and electric companies, suggested many changes in phraseology and asked that a commission of three members at \$5,000 be appointed instead of five members at \$3,500. A sub-committee of five was appointed to redraft the bill

NEW JERSEY

The corporation committee of the New Jersey Senate reported the employers' liability bill on Feb. 28, 1911, with certain amendments. The public utilities bill, with a rate making clause, has been carefully considered by the committee on railroads and canals, and is expected to be reported soon in the form of a committee substitute. The public utilities bill favored by the Democrats would legislate the present public utilities board out of office and create a new board, while the Republican measure would not affect the personnel of the present board.

NEW YORK

A bill has been introduced in New York to require the Long Island Railroad to charge a fare of not more than 5 cents between its Flatbush Avenue terminal, Brooklyn, and its station at Railroad Avenue, Brooklyn. Senator Wainright and Assemblyman Coffey have introduced a bill to require the New York, New Haven & Hartford Railroad to sell tickets for transportation between the Grand Central Station, New York, and points in Westchester County at the same commutation rate as is charged by the company between its station in Boston and points within a distance of 25 miles of Boston.

OHIO

At the public hearing of the Winters public utility bill before the Ohio House on March 1 none of the interests affected were represented except the telephone companies. Another hearing will be held. The committee on cities of the House has killed the Geleerd municipal ownership bill by voting to postpone it indefinitely. Senator Todd has introduced a bill to allow railroad, telegraph, telephone and cable companies to interchange service. The House has passed the two Lorenz bills, which extend to interurban railways the provisions of the steam railroad law regarding fencing right-of-way and erecting cattle guards.

Financial and Corporate

New York Stock and Money Market

March 7, 1911.

After a listless week the professional interest took active hold of the Wall Street market on Saturday morning and the recovery was general, as it was thought that the bogey of an extra session had assumed less importance. Just prior to the closing of the market, however, President Taft's announcement of the extra session was made, with the result that transactions on Monday were limited. To-day the number of sales decreased further, the total being 221,341 for the day.

The bond market, despite the trend in the trading in stocks, was quite active on Monday. Quotations to-day were: Call, 2@2 2/3 per cent; 60 days, 2 3/4@3 per cent.

Other Markets

All the Philadelphia issues have continued strong. The bid for Union Traction to-day was 47 1/2. Philadelphia Rapid Transit, however, went to 20 1/2 to-day. The sale is recorded of \$120,000 of Interstate Railway 4s in blocks ex interest at 55.

The Boston market has been very irregular with little or no interest in tractions and only fractional changes in price.

The Chicago market has been featureless and dull. To-day, however, important sales were recorded of Chicago Railways 4s, Series B, Chicago Railways first mortgage 5s and Chicago Railways collateral trust 6s.

In Baltimore United Railways incomes, United Railways refunding 5s, Fairmont & Clarksburg Traction 5s and Maryland Electric 5s have all figured in the trading recently.

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

	Feb. 28.	Mar. 7.
American Light & Traction Company (common).....	a290	a290
American Light & Traction Company (preferred).....	a106	a106
American Railway Company.....	a44	a44
Aurora, Elgin & Chicago Railroad (common).....	a44	a44
Aurora, Elgin & Chicago Railroad (preferred).....	a85 3/4	a85 3/4
Boston Elevated Railway.....	a129	a129
Boston Suburban Electric Companies (common).....	a16	*16
Boston Suburban Electric Companies (preferred).....	71	*71
Boston & Worcester Electric Companies (common).....	a10	*10
Boston & Worcester Electric Companies (preferred).....	40	*40
Brooklyn Rapid Transit.....	78	78 1/2
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	83 3/4	83 7/8
Capital Traction Company, Washington.....	*129	a128
Chicago City Railway.....	*190	a200
Chicago & Oak Park Elevated Railroad (common).....	*3 1/4	*3 1/4
Chicago & Oak Park Elevated Railroad (preferred).....	*7 1/2	*7 1/4
Chicago Railways, pteptg., ctf. 1.....	a92 1/2	a92
Chicago Railways, pteptg., ctf. 2.....	a23 1/2	a25
Chicago Railways, pteptg., ctf. 3.....	a33 1/2	a9 1/2
Chicago Railways, pteptg., ctf. 4.....	a5	5 1/4
Cleveland Railway.....	a94	a95
Consolidated Traction of New Jersey.....	a76	a76
Consolidated Traction of N. J., 5 per cent bonds.....	a105	a105
Detroit United Railway.....	a71	71
General Electric Company.....	a153	149
Georgia Railway & Electric Company (common).....	a129 1/4	*129 1/4
Georgia Railway & Electric Company (preferred).....	87	*87
Interborough Metropolitan Company (common).....	19	18 7/8
Interborough Metropolitan Company (preferred).....	53	52
Interborough Metropolitan Company (4 1/2s).....	78 5/8	78 5/8
Kansas City Railway & Light Company (common).....	a25	25
Kansas City Railway & Light Company (preferred).....	a72	a68
Manhattan Railway.....	140	140
Massachusetts Electric Companies (common).....	17	17
Massachusetts Electric Companies (preferred).....	a88	a88
Metropolitan West Side, Chicago (common).....	a20	a22
Metropolitan West Side, Chicago (preferred).....	67	a67
Metropolitan Street Railway, New York.....	*15	*15
Milwaukee Electric Railway & Light (preferred).....	110	110
North American Company.....	71 1/2	70 7/8
Northwestern Elevated Railroad (common).....	*22	a23
Northwestern Elevated Railroad (preferred).....	*62	a64
Philadelphia Company, Pittsburgh (common).....	a53 1/4	a53 1/2
Philadelphia Company, Pittsburgh (preferred).....	a43 1/2	a43 1/2
Philadelphia Rapid Transit Company.....	a20 1/2	a20 1/2
Philadelphia Traction Company.....	85	a86
Public Service Corporation, 5 per cent col. notes.....	a96 1/2	a96 1/2
Public Service Corporation, ctf. s.....	a105 1/2	a105 1/2
Seattle Electric Company (common).....	a112	a112
Seattle Electric Company (preferred).....	101 1/2	a101 1/2
South Side Elevated Railroad (Chicago).....	*69	a70
Third Avenue Railroad, New York.....	11	a10
Toledo Railways & Light Company.....	a10	10
Twin City Rapid Transit, Minneapolis (common).....	a110	109 1/2
Union Traction Company, Philadelphia.....	a48	a47 3/4
United Rys. & Electric Company, Baltimore.....	17 3/4	17 3/4
United Rys. Inv. Co. (common).....	47 3/8	46 1/2
United Rys. Inv. Co. (preferred).....	74	73 1/2
Washington Ry. & Electric Company (common).....	35	a35 1/4
Washington Ry. & Electric Company (preferred).....	88	a88
West End Street Railway, Boston (common).....	a92 1/2	a92 1/2
West End Street Railway, Boston (preferred).....	a102 1/2	a103 1/2
Westinghouse Elec. & Mfg. Co.....	60 3/4	67 1/4
Westinghouse Elec. & Mfg. Co. (1st pref.).....	a120	a120

a Asked. * Last Sale.

Annual Report of Lehigh Valley Transit Company

The report of the Lehigh Valley Transit Company for the year ended Nov. 30, 1910, has been made public. In submitting the report R. P. Stevens, president of the company, said that as this was the first time that the report has been prepared in pamphlet form and mailed to the stockholders he had quite fully described the property. Mr. Stevens has described briefly the history of the incorporation of the company, the territory through which it operates, etc., but the abstracts which are made of his statements relate only to the work carried out during the year covered by the operating report. A statement of the earnings of the company for the year ended Nov. 30, 1910, as compared with the previous year, follows:

	1910.	1909.
Passenger receipts.....	\$1,042,969	\$956,886
Operating expenses.....	562,344	548,171
Net earnings.....	\$480,625	\$408,715
Miscellaneous and sale of power.....	159,851	110,998
Gross income.....	\$640,476	\$519,713
Deductions: Bond interest, rentals, taxes, etc....	436,872	416,646
Net income.....	\$203,604	\$103,067
Miscellaneous deductions.....	261	4,956
Surplus.....	\$203,343	\$98,111
Other income.....	6,857	3,575
Surplus.....	\$210,200	\$101,686

Mr. Stevens said, in part:

"The surplus was arrived at after making liberal deductions for maintenance. The receipt of \$69,500 from sale of the Chestnut Hill and Spring House Turnpike is not included in the foregoing summary, being credited to capital account and applied largely toward installation of new power.

"On Nov. 30, 1910, your company had surplus earnings amounting to \$576,341.85. Construction and rehabilitation charges, bond discount, commission and expenditures in connection with the refinancing of the company during the past three years were charged against this surplus, leaving the balance in the surplus account \$7,324.84 on Dec. 1, 1910.

"On May 19, 1910, you authorized an issue of refunding and improvement mortgage 50-year 5 per cent gold bonds to be secured by a mortgage covering substantially the entire property of your company, subject to the prior liens hereinafter referred to. The total authorized issue of refunding and improvement mortgage bonds is \$15,000,000. The mortgage provides that bonds shall be reserved to retire or acquire the first mortgage bonds and the consolidated mortgage bonds. The authorized amount of first mortgage bonds is \$5,000,000, of which there are \$4,700,000 outstanding. The issue of consolidated mortgage bonds amounts to \$2,500,000 (in addition to bonds reserved for the retirement of the first mortgage bonds). Of these latter bonds \$2,146,000 have been acquired (leaving \$354,000 outstanding) and deposited with the trustee as additional security for the refunding and improvement mortgage bonds.

"The acquisition of consolidated mortgage bonds, the retirement of the debentures and the issuance of refunding and improvement mortgage bonds will leave the company's present bonded indebtedness outstanding as follows:

First mortgage gold bonds: 5 per cent.....	\$1,930,000
First mortgage gold bonds: 4 per cent.....	2,770,000
	\$4,700,000
Consolidated mortgage bonds.....	354,000
Refunding and improvement mortgage bonds.....	3,956,000
	\$8,110,000

"Your company has outstanding \$5,000,000 preferred stock, 5 per cent cumulative from Nov. 3, 1910, and \$3,000,000 common stock. It has no floating debt. The acquisition of the \$2,146,000 consolidated mortgage bonds and retirement of the \$900,000 debenture bonds have been accomplished with the addition of only \$12,960 to the company's annual fixed charges.

"The physical condition of your property has been improved materially during the past three years. Your cars have all been overhauled and repaired and about 40 cars have been rebuilt. Thirty-six Baldwin trucks were purchased during the past year, replacing all the St. Louis trucks and standardizing the equipment to Baldwin and Brill trucks, according to the service.

"The cost of power has steadily and substantially de-

creased during the past three years and with the installation, about June, 1911, of new apparatus, we look for still further economies in cost of power:

	1907.	1908.	1909.	1910.
Cost of power per car mile (cents).....	.0573	.0358	.0332	.0308
Power output, railway (kw.).....	15,584,795	17,683,835	17,773,610	19,139,821
Total cost, railway.....	\$188,861	\$123,617	\$113,997	\$110,623

"A new paint shop was built on land which your company owned adjoining the Allentown car house at a cost of about \$6,000. This, when completed, will permit the utilization of the present carpenter shop space for general machine shop purposes, providing adequate room for the present necessities of the company. The shops and car houses are in good condition and are well equipped.

"Ten new passenger cars, one new freight car, two new work cars and five long-broom snow sweepers have been added to the equipment this year; all of which have been used to advantage in reducing the cost of operation.

"The traffic department is a new department, organized in September, 1910, to give greater attention and study to traffic conditions in order that the company may serve the public with increasing satisfaction. It embraces a consolidation of the park, express, advertising, excursion, publicity and industrial departments. A competent man has been found to take charge of this department, and the few months of its existence have fully demonstrated the wisdom of its establishment.

"The court upheld the award of a Chester County jury for damages arising out of the condemnation of the Chestnut Hill and Spring House Turnpike, and Montgomery County has since forwarded to the company its check for \$80,913 in payment for this turnpike, representing costs and interest; of which there was received the sum of \$69,500, being the net amount of your company's interest in the turnpike company. The turnpike company therefore has been dissolved, the action ridding us of the last of our three troublesome turnpikes.

"In conclusion I wish to say that as the business of your company is steadily and substantially increasing, the percentage of operating expense to earnings steadily decreasing and the physical condition of the property materially improving, the prospects for the future are extremely promising. I wish to express my sincere appreciation of the hearty and efficient co-operation and support received from the officers and employees of the company and its allied interests."

Earnings of New York State Railways

The New York State Railways, Rochester, N. Y., has filed with the New York Stock Exchange the following report of its earnings for the year ended Dec. 30, 1910:

Earnings from operation.....	\$3,421,790
Expenses of operation.....	2,063,643
Net earnings from operation.....	\$1,358,146
Taxes.....	236,945
Net earnings.....	\$1,121,201
Dividends received from subsidiary companies.....	569,633
Total income.....	\$1,690,835
Interest, rentals, etc.....	527,124
Balance available for dividends.....	\$1,163,710
Dividends preferred stock.....	\$249,353
Dividends common stock.....	897,517
	1,146,871
Net surplus.....	\$16,838

Beaumont (Tex.) Traction Company.—James F. Weed, receiver of the Beaumont Traction Company, has been authorized to issue \$125,000 of receiver's certificates to provide funds to improve the property of the company.

Boston & Northern Street Railway, Boston, Mass.—The Massachusetts Railroad Commission has approved an issue of \$666,000 of 50-year 4 per cent bonds of the Boston & Northern Street Railway. The bonds shall not, without further authority of the board, be sold at less than 90 per cent of their par value. The company in its petition to the commissioner asked for authority to issue \$700,000 of 4 per cent 50-year bonds to retire its floating indebtedness incurred in new construction and equipment, also for further additions and betterments.

Boston & Worcester Street Railway, Boston, Mass.—The Massachusetts Railroad Commission has authorized the

Boston & Worcester Street Railway to issue 3972 shares of preferred stock at 110.

Charleston Consolidated Railway, Gas & Electric Company, Charleston, S. C.—A meeting of the stockholders of the Charleston Consolidated Railway, Gas & Electric Company has been called for March 22, 1911, to vote on the question of increasing the capital stock by an issue of \$1,000,000 of common stock, making the capital stock \$3,000,000, including the present common of \$1,500,000 and the preferred of \$500,000.

Chicago (Ill.) Railways.—Final settlement of the Chicago Railways litigation over the Chicago Consolidated Traction Company was made by an order of Feb. 21, 1911, which has been filed in the United States Circuit Court at Chicago, Ill.

Chicago & Milwaukee Electric Railroad, Chicago, Ill.—It is reported in Chicago that an effort is being made to reorganize the Chicago & Milwaukee Electric Railroad on the basis of an exchange of the present first mortgage bonds of 1919 for par in the first mortgage bonds of the new company, the 1922 bonds for par in first income 4 per cent bonds of the new company, and the 1925 bonds for 50 per cent in second income 4 per cent bonds and 50 per cent in the stock of the new company.

Dayton (Ohio) Street Railway.—The Dayton Street Railway has filed articles with the Secretary of State providing for an increase in the capital stock of the company from \$1,200,000 to \$1,300,000.

Denver (Col.) City Tramway.—William L. Bull, New York, N. Y., has been elected a director of the Denver City Tramway to succeed the late Charles J. Hughes.

Halifax (N. S.) Electric Tramway.—The Halifax Electric Tramway has declared a quarterly dividend of 2 per cent on its \$1,400,000 of capital stock, payable April 1, 1911. This dividend compares with $1\frac{3}{4}$ per cent paid quarterly since January, 1910, and $1\frac{1}{2}$ per cent paid previously for several years.

Interborough-Metropolitan Company, New York, N. Y.—Application has been made to the New York Stock Exchange to list \$45,740,000 preferred stock voting trust certificates of the Interborough-Metropolitan Company.

Interstate Railways, Philadelphia, Pa.—Notice has been given that the interest coupons, Nos. 14, 15 and 16, of the collateral trust bonds of the Interstate Railways, due on Feb. 1, 1910; Aug. 1, 1910, and Feb. 1, 1911, will be paid on presentation at the office of the Real Estate Title, Insurance & Trust Company, Philadelphia, Pa., trustee, on and after March 7, 1911.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has announced that it will sell \$500,000 of bonds to cover proposed improvements.

Manistee Light & Traction Company, Manistee, Mich.—The sale of the property of the Manistee Light & Traction Company under foreclosure, postponed from Jan. 18, 1911, has been fixed for March 15, 1911, by order of the United States District Court.

Meadville & Conneaut Lake Traction Company, Meadville, Pa.—A syndicate composed largely of Cleveland (Ohio) capitalists is reported to have arranged with the bondholders of the Meadville & Conneaut Lake Traction Company to take over the property of this company which they purchased recently at foreclosure sale, as noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 21, 1911, page 135. It is proposed to organize the Northwestern Pennsylvania Railways Company to succeed the Meadville & Conneaut Lake Traction Company.

Metropolitan Street Railway, New York, N. Y.—Judge Lacombe has again adjourned the sale of the property of the Metropolitan Street Railway under foreclosure. The new date has been fixed for April 20, 1911.

Mount Vernon (Ohio) Electric Company.—The Mount Vernon Electric Company has increased its capital stock from \$300,000 to \$375,000.

North Jersey Rapid Transit Company, Paterson, N. J.—The Board of Public Utility Commissioners of New Jersey has authorized the North Jersey Rapid Transit Company to issue \$195,000 of bonds and \$163,000 of stock of the company at par.

Oakland & Antioch Electric Railway, Oakland, Cal.—Wakefield, Garthwaite & Company, San Francisco, Cal., offer for subscription at 85 and interest with 100 per cent bonus in stock the unsold portion of \$1,000,000 of first mortgage 5 per cent sinking fund gold bonds of the Oakland & Antioch Electric Railway, Oakland, Cal., dated July 1, 1910, and due July 1, 1940. The trustee of the issue is the Anglo-California Trust Company, San Francisco, Cal. The authorized capital stock of the company is \$3,500,000, all of which has been issued, and the authorized issue of bonds is \$2,000,000, of which \$1,500,000 has been issued. The first section of the Oakland & Antioch Electric Railway was recently placed in operation between Bay Point and Concord, as noted in the *ELECTRIC RAILWAY JOURNAL* of March 4, 1911, page 392.

Ottawa (Ont.) Electric Railway.—The Ottawa Electric Railway has issued its pamphlet report for the year ended Dec. 31, 1910. The company reports gross receipts for 1910 of \$748,708, as compared with \$677,357 for 1909; total expenses, including mileage payments, taxes and interest for 1910, of \$528,025, as compared with \$479,502 for 1909, and net income for 1910 of \$220,683, as compared with \$197,854 for 1909. In 1910 16,967,334 passengers were carried as against 14,983,799 for 1909. The percentage of operating expenses to gross receipts in 1910 was 63 per cent, as compared with 63.5 per cent in 1909.

Philadelphia Company, Pittsburgh, Pa.—The Philadelphia Company has informed the Philadelphia Stock Exchange that the outstanding stock of the company has been increased to \$38,531,000 through the conversion of all of the \$2,500,000 of sterling debentures which are due in 1920 and \$31,000 of the \$2,500,000 to convertible debentures which are due on Aug. 1, 1919.

Philadelphia (Pa.) Rapid Transit Company.—George H. McFadden, Arthur E. Newbold and Rudolph Ellis have been selected as the voting trustees under the plan proposed by E. T. Stotesbury, of Drexel & Company, Philadelphia, Pa., for refinancing the Philadelphia Rapid Transit Company. Mr. McFadden is head of a large cotton firm, director of a number of banks and was a director of the Lehigh Valley Railroad. Mr. Newbold is a member of J. P. Morgan & Company and Drexel & Company, and is a director of several financial institutions. Mr. Ellis is president of the Fidelity Trust Company and a director of the Pennsylvania Railroad.

Quakertown (Pa.) Traction Company.—The Lehigh Valley Transit Company has withdrawn its offer to purchase the first mortgage 5 per cent bonds of the Quakertown Traction Company.

Rochester Railway & Light Company, Rochester, N. Y.—Harris, Forbes & Company, New York, N. Y., offer for subscription at 101 and interest \$826,000 of consolidated mortgage 5 per cent bonds of the Rochester Railway & Light Company, dated July 1, 1904, and due July 1, 1954. The official statement of the earnings of the company for the year ended Jan. 31, 1911, follows: Gross earnings, \$3,203,253; operating expenses and taxes, \$1,665,255; net earnings, \$1,537,997; interest on outstanding bonds, \$759,582; surplus, \$778,415.

South Side Elevated Railroad, Chicago, Ill.—The directors of the South Side Elevated Railroad have declared a quarterly dividend of $\frac{5}{8}$ of 1 per cent, increasing the annual rate from 2 per cent to $2\frac{1}{2}$ per cent. The dividend is payable on March 31, 1911, to stock of record on March 20, 1911.

Underground Electric Railways of London, Ltd., London, Eng.—The entire issue of \$5,000,000 of 5 per cent prior lien bonds of the Underground Electric Railways of London, Ltd., due in 1920, has been called for redemption at par and interest on Sept. 1, 1911.

Utah Light & Railway Company, Salt Lake City, Utah.—The Union Trust Company, Chicago, Ill., is offering for subscription to yield 5.25 per cent a block of first mortgage 5 per cent bonds of the Consolidated Railway & Power Company, dated July 1, 1901, and due July 1, 1921. The bonds are a first lien underlying security of the Utah Light & Railway Company.

Virginia Railway & Power Company, Richmond, Va.—A meeting of the stockholders of the Virginia Railway &

Power Company has been called for March 14, 1911, to authorize a mortgage supplemental to that securing an authorized issue of \$15,000,000 of first and refunding mortgage bonds; to refund certain bonds secured by underlying mortgage liens mentioned in the first refunding mortgage, and to authorize the sale of \$2,000,000 of first and refunding mortgage bonds, being a part of the bonds reserved for refunding and retiring underlying bonds and for improvements, additions and extensions and other corporate purposes.

Washington, Baltimore & Annapolis Electric Railway, Washington, D. C.—It is reported in Cleveland that the Pennsylvania Railroad will probably bid for the property of the Washington, Baltimore & Annapolis Electric Railway in competition with the reorganization committee when the sale under foreclosure is held on March 20, 1911. The details of the plan of the committee representing the bondholders for the reorganization of the company were referred to in the *ELECTRIC RAILWAY JOURNAL* of Nov. 19, 1910, page 1044, and Nov. 26, 1910, page 1078.

West Penn Traction Company, Pittsburgh, Pa.—J. S. and W. S. Kuhn, Inc., Pittsburgh, Pa., and Kuhn, Fisher & Company, Boston, Mass., offer for subscription at 97 and interest the unsold portion of the present issue of \$443,500 of first mortgage 5 per cent gold bonds of the West Penn Traction Company, dated June 1, 1910, and due June 1, 1960.

Youngstown & Sharon Railway & Light Company, Youngstown, Ohio.—The Youngstown & Sharon Railway & Light Company filed its answer in the Court of Chancery at Trenton, N. J., on March 2, 1911, denying the charge of E. Clarence Jones, New York, N. Y., that the company was applying surplus profits to other purposes when such profits should be used to pay dividends.

Dividends Declared

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¼ per cent, preferred.
 Chicago (Ill.) City Railway, quarterly, 2½ per cent.
 Philadelphia (Pa.) Traction Company, \$2.
 Second and Third Streets Passenger Railway, Philadelphia, Pa., quarterly, \$3.
 Sao Paulo Tramway, Light & Power Company, Ltd., Sao Paulo, Brazil, quarterly, 2½ per cent.
 South Side Elevated Railroad, Chicago, Ill., quarterly, ⅝ of 1 per cent.
 Union Railway, Gas & Electric Company, Rockford, Ill., quarterly, 1½ per cent, preferred.
 Whatcom County Railway & Light Company, Bellingham, Wash., 3 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD.						
Period.		Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.
1m., Jan.	'11	\$121,196	\$89,492	\$31,704	\$35,016	†\$3,314
1 "	"	101,784	77,998	23,786	31,964	†8,178
7 "	"	1,055,653	593,326	462,327	236,912	225,415
7 "	"	959,791	522,900	436,890	209,539	227,351
CLEVELAND, PAINESVILLE & EASTERN RAILROAD.						
1m., Jan.	'11	\$23,114	*\$13,578	\$9,536	\$8,172	\$1,364
1 "	"	21,084	*12,238	8,847	7,986	861
LAKE SHORE ELECTRIC RAILWAY SYSTEM.						
1m., Jan.	'11	\$84,569	*\$49,358	\$35,212	\$34,628	\$584
1 "	"	78,994	*48,539	30,455	34,270	†3,816
MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY.						
1m., Jan.	'11	\$418,427	\$218,828	\$199,599	\$119,481	\$80,118
1 "	"	386,716	219,429	167,287	111,374	55,913
MILWAUKEE LIGHT, HEAT & TRACTION COMPANY.						
1m., Jan.	'11	\$121,266	\$36,771	\$84,495	\$69,122	\$15,373
1 "	"	112,483	36,414	76,068	67,278	8,790
NORTHERN OHIO TRACTION & LIGHT COMPANY.						
1m., Jan.	'11	\$186,271	*\$106,904	\$79,367	\$44,429	\$34,938
1 "	"	164,944	*94,500	70,444	43,292	27,152
PUGET SOUND ELECTRIC RAILWAY.						
1m., Dec.	'10	\$157,982	\$103,693	\$54,289	\$50,065	\$4,224
1 "	"	148,994	108,402	40,592	49,080	†8,487
12 "	"	1,915,289	1,252,410	662,879	608,078	54,801
12 "	"	1,869,096	1,250,588	618,508	570,048	48,460
SAVANNAH ELECTRIC COMPANY.						
1m., Dec.	'10	\$53,515	\$36,017	\$17,498	\$17,481	\$17
1 "	"	50,288	32,683	17,605	17,599	6
12 "	"	632,356	416,234	216,122	215,012	1,110
12 "	"	603,814	392,351	211,463	209,693	1,770

*Includes taxes. †Deficit.

Traffic and Transportation

Resolution of Thanks from Employees to President of Public Service Railway

At a recent joint meeting of the West Hoboken and West New York Social Clubs of the Public Service Railway held at the club rooms for the employees of the company in West Hoboken the following resolutions were adopted:

"Whereas our worthy and highly respected president, Thomas N. McCarter, together with the other officers and directors of the Public Service Railway, has generously provided a sick and death benefit and pension fund for employees; therefore be it

"Resolved, That we herewith express our sincere appreciation of the steps that have been taken in promoting our welfare, and we trust that we may continue to labor for the company's interest with even greater zeal, if possible, in the future as an evidence of our recognition of the company's generosity toward us, feeling that it will spur us to the accomplishment of larger results.

"Resolved, That this tribute of respect and regard for our esteemed president and directors and for the members of the welfare committee be entered upon the minutes of our proceedings, and a copy be forwarded to our president."

The resolutions were presented to Mr. McCarter at his office in Newark by a delegation of employees who were introduced by R. E. Danforth, general manager of the company. In addressing the men Mr. McCarter said:

"We are honestly trying to solve the problems which confront large corporations, especially the problems of capital and labor, and to establish satisfactory reciprocal relations between employers and employees. We are always ready to give a hearing to matters which relate to the happiness of the men. I am inclined more and more to the view that a large corporation owes something to its men besides their daily wage. We are trying to do for our men all that the resources of the company will permit. We are helping to take care of you when you are sick. We provide a pension for your old age because you give the best years of your life to the company and, in a small way, we provide for those who are left after you die. The plan that has been put into effect has been carefully studied and is the most comprehensive we could devise. Everything is paid by the corporation.

"This is only part of the general welfare plan. You have your club rooms and we are trying to make your working conditions as pleasant as possible. We want to develop an *esprit de corps* which will redound to our own as well as to the company's benefit. I am working for the company as well as you, although our duties are along different lines. We want you to know that we appreciate the spirit you show and you will always find your superior officers ready to talk matters over with you. We want to make this corporation one in which the true feeling of brotherhood will prevail. I thank you again for these resolutions and will show them to our executive committee and our board of directors when they meet."

Increase in Fare on Illinois Road

The Galesburg & Kewanee Electric Railway, Kewanee, Ill., announced that on March 1, 1911, it would put into effect the following increase in fares on its line, which connects Kewanee and Galva, a distance of 13 miles: One way, full fare, from 18 cents to 20 cents; one way, half fare, from 9 cents to 10 cents; Sunday round trip, full fare, from 25 cents to 30 cents; Sunday round trip, half fare, from 13 cents to 15 cents; mileage books, from \$3.75 to \$4.

In announcing the increase R. H. Hayward, general manager of the company, issued a long statement in which he said: "The relation of receipts to expenses has been a constant source of anxiety to the directors of this company since the first car was started in 1903, for at no time has a dividend been earned to compensate the stockholders for the money, time and labor expended in the organization, construction and operation of the property. Not only has the company not been able to pay dividends, but it has not even earned sufficient revenue above current expenses to maintain its property in good condition and to provide for

depreciation which will necessitate the purchase of new cars, dynamos, engines, boilers and other equipment when the old property is worn out. This is a condition of affairs that cannot continue indefinitely.

"A property which cannot make both ends meet soon reaches the point where it cannot borrow money to make up the deficit. When that point is reached it may try to struggle along by lowering its standard of service, by making no expenditures for new equipment, even when needed, and by avoiding repairs to cars, track or other parts of the property that are not absolutely necessary to enable the wheels to turn. All of these measures are demoralizing to the company and disgusting to the public which depends upon it for service. If these measures fail, then the plant is closed down and the public gets no service.

"This plain statement of the facts is made because the company believes that if its patrons fully understand the situation they will approve and commend its action as a necessary business proposition, and will cheerfully accommodate themselves to it. The company values the respect and friendship of those who do business with it, and feels that it will be better entitled to these considerations if it endeavors to maintain its business on a sound financial basis than if it allowed its property to run down and depreciate and clearly neglected what the Supreme Court of the United States has declared to be 'a plain duty to the public.'"

Interurban Company Adopts Seniority Rule.—The Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has adopted the seniority method of assigning runs.

Riding in the Vestibule Prohibited.—The Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., is strictly enforcing the rule which prohibits persons, whether or not they are employees, from riding in the motorman's vestibule of interurban cars.

Reduction in Fare Between Indianapolis and Broad Ripple.—The Indiana Union Traction Company, Indianapolis, Ind., has announced a reduction in fare between Indianapolis and Broad Ripple from 10 cents to 5 cents after April 1, 1911. Broad Ripple Park will be improved and a new hotel constructed.

Souvenir Postals of Interurban Line.—Frank I. Hardy, superintendent of transportation of the Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind., has had a large edition of souvenir postcards printed which show views along the lines of the company and pictures of cars. He will have the postcards distributed in the stations of the company.

Accident Fakir Sentenced in Baltimore.—William G. Fossbenner, who was arrested on Sept. 8, 1909, charged with attempting to defraud the United Railways & Electric Company, Baltimore, Md., out of \$60 by means of false pretenses and false representation in an accident case, pleaded guilty on March 2, 1911, in the Criminal Court, Part 2, Baltimore, and was sentenced to 60 days' imprisonment by Judge Harlan.

Advertising a Louisville Road.—The Louisville & Northern Railway & Lighting Company, Louisville, Ky., has done some effective newspaper advertising of late, calling attention to the advantages of living on the "North Side." One of its most effective advertisements follows: "Out of the turmoil and the noise and dirt of the city—that's where you will live happiest. The North Side offers this. Ask a real estate man or take the big red car and see for yourself."

Efficiency Club in Boston.—Under the title of the Efficiency Club the officials and heads of departments of the Boston (Mass.) Elevated Railway have formed an organization to meet about once a month and discuss methods of improving the efficiency of the service. The first meeting was held on the evening of March 1, 1911, at the Parker House. At the next meeting H. M. Stewart, roadmaster of the elevated division, will present a paper, "The Handling of Supplies at the George Street Yards."

Complaints to the Pennsylvania Commission.—The Railroad Commission of Pennsylvania heard several complaints in Philadelphia on March 4, 1911, including one by residents of Elmwood against the service rendered by the

Southwestern Traction Company, now in the hands of receivers. The commission decided that it had no jurisdiction in this case. The commission has received a complaint about the transfer system of the City Passenger Railway, Altoona. Ralph A. Weiss, Philadelphia, contended that the Philadelphia Rapid Transit Company had not improved service to the League Island Navy Yard.

Prize to Employees for Papers.—The Interborough Club, composed of employees of the Interborough Rapid Transit Company, New York, N. Y., has offered cash prizes for the best articles on either "The Relationship of Employees to the Traveling Public" or "How the Efficiency of the Service May Be Increased." For the best article the club will pay \$50, for the next best \$25, and for the third best \$10. The author must submit his paper to the Interborough Club through the head of his department. The paper must not contain less than 500 words or more than 1000 words. All papers must be in the hands of the club by March 15. The prize winners will be announced in the April issue of the *Interborough Bulletin*.

Seattle Electric Journal.—The *Seattle Electric Journal* has succeeded the *Live Wire*, a bi-monthly published throughout 1910 in the interest of the employees of the Seattle Electric Company. The *Electric Journal* is 6 in. x 9 in. and is different in dress from the *Live Wire*. In announcing the change the *Electric Journal* said in part: "The *Seattle Electric Journal* will promote a wider scope than its predecessor, and the field of usefulness that is intended for it to occupy has been materially extended so that a more comprehensive reflection of the sentiments of officials and subordinates alike may be obtained. The initial issue will be distributed among the employees but subsequent editions are to have a wider circulation than the limits imposed by the lists of co-workers of the Seattle Electric Company. The *Electric Journal* is to appear regularly on the second Saturday of each month."

Hearing on Commutation Fares on New Haven Out of New York.—At a hearing held in New York on Feb. 23, 1911, on the application of the Connecticut Commuters' League to the Interstate Commerce Commission for a reduction in the commutation rates established on July 1, 1910, between the Grand Central Station, New York, and New Haven, counsel were given until March 9, 1911, to file briefs with the commission. Counsel for the commuters put in evidence a schedule of rates out of Boston on the New York, New Haven & Hartford Railroad which has been in force since 1908 as a basis for comparison with the rates which prevail out of New York. William B. Hopkins, a commuter of Bridgeport, was the only witness called. He said that very few commuters used the 60 trips provided on the monthly ticket and submitted a compromise rate card on a basis of five mills per mile on a 50-trip ticket.

New Transfers in Detroit.—The Detroit United Railway has completed a new system of transfers for the Woodward Avenue cars, to enable conductors to issue slips without taking the time to punch them. The new transfers are issued in colors to distinguish those good on the so-called 3-cent lines from those good only on the 5-cent lines. The distinction is made to prevent a passenger who uses a workingman's ticket from transferring to a 3-cent line. The fare in each case is represented by a ticket which sells at eight for a quarter, but the colors of the transfers are different, so as to prevent unrestricted transfer privileges. Brown transfers are used for the 5-cent lines and white for the 3-cent lines. Cuts in the transfers, indicating the month and date, are made en bloc before the transfers are turned over to the conductors. The new transfers carry a diagram in which a single punch mark, made at the beginning of a trip, indicates either a. m. or p. m., as well as the direction in which the car is moving.

Increase in Wages in Texarkana.—W. L. Wood, Jr., manager of the Texarkana Gas & Electric Company, Texarkana, Tex., recently announced an increase in wages of all motormen and conductors in the employ of the company of 16 per cent. The increase became effective on March 1, 1911. In a statement which he made public Mr. Wood requested the employees to support the company in its efforts to "deliver the city the best street railway service in a city of its size." Commenting on the increase, the *Daily Texarkanian* said: "It will be the opinion of many that Mr. Wood

might have left off the words 'in a city of its size,' as the exceptionally good service of Texarkana's public utilities, and particularly the modern street car system, has frequently occasioned favorable comment by visitors and home people." To make it plain to the public what the increase means the same paper put the matter of the increase as follows: "To the company it means that of its own volition and accord it is distributing among its employees an amount equal to interest at 10 per cent on an investment of \$35,000. In other words, the action is equivalent to the company placing \$35,000 in trust and conveying the income from this amount to the motormen and conductors. To pay this increase in wages it will be necessary for the company to haul 70,000 people. It means that the directors must give up the chance of having these 70,000 nickels added to the profits and see them go into the pockets of their employees."

Protest Against "No-Seat-No-Fare" Ordinance Carried to Commission.—The Trenton (N. J.) Street Railway appealed to the Board of Public Utility Commissioners on Feb. 28, 1911, against the "No-Seat-No-Fare" ordinance which was passed by the Trenton Common Council in April, 1910, so as to stay action that was to have been taken in the Central Police Court at Trenton looking toward the collection of penalties for violation of the ordinance. When the cases were called counsel for the company gave notice of the appeal to the commission and Justice Harris adjourned the hearing pending a decision by the commission. It is contended by the company that passengers anxious to reach their destination are willing to stand on front or rear platforms or in the aisles of cars rather than to wait for the following cars; that the public has a right to make such use of the aisles and platforms, and that the company cannot restrain them from so doing. The practice of standing in cars has become a fixed custom, the company says, and any effort of the company to remove passengers who refused to pay their fare would inconvenience the public and create disorder. On the other hand, to require the company to carry passengers without the payment of a fare would be in violation of the State Constitution, which forbids the taking of private property for public use without just compensation. In short, the company contends that the ordinance is unreasonable and unjust; that it is in contravention of the rights of the company; that it is impossible to comply with the directions of the ordinance; that it is impracticable to operate cars as prescribed by the ordinance.

Trials of a Subway Guard in New York.—A guard on the subway division of the Interborough Rapid Transit Company, New York, N. Y., recently wrote a letter to the editor of the New York *Evening Sun* in which he protested against ill use by the traveling public. The disregard of the ordinary decencies of life on the part of the traveling public which this man cites is strikingly illustrated in the following abstract of his letter: "I should like you to allow me to protest against the condition of mind of many of those who travel in the subway and to their growing spirit of hostility toward conductors and guards in the performance of their duties. The spirit of hostility manifests itself in several ways. Here are some of them: Showcrying wholesale abuse upon guards who accidentally touch them in closing a door on a crowded car; swearing at, abusing and threatening to report guards when caught on entering a center side door; forgetting that they have 10 times more opportunity to see and protect themselves against such occurrences than the guard; standing in the doorways and refusing to move, thus impeding the egress and ingress of passengers; savagely rushing and pushing when boarding the train during rush hours; rushing up after the starting signal has been passed and spitting in the guard's face when he refuses to open the doors; cursing, abusing and generally visiting their wrath on guards when accidents or delays tie up the service; ignorantly and savagely attempting to pass (behind the guard) from one car to another, preventing him shutting the doors and thus causing delay to the train; hurling vile names and using obscene language (quietly) at guards when they have failed to board the train and it is pulling out of the station. In most civilized countries the law is very severe on people annoying or interfering with railway servants in the discharge of their duties, but such does not seem to apply here, where in a few cases persons have been commended from the bench when they expressed their indignation by assaulting such servants."

Personal Mention.

Mr. E. O. Reed has been appointed auditor of the Western Ohio Railroad with headquarters at Lima, Ohio, to succeed Mr. R. H. Carpenter, deceased.

Mr. Julian Adams has been appointed engineer of the Los Angeles-Pacific Company and the Pacific Electric Railway, Los Angeles, Cal., in charge of the power supply and electric distribution.

Mr. D. F. Sherman, president of the Providence & Danielson Railway, Providence, R. I., has been elected president of the Sea View Railroad, Wickford, R. I., to succeed Mr. Andrew Radel.

Mr. William F. Smith has been appointed engineer of the Los Angeles-Pacific Company and the Pacific Electric Railway, Los Angeles, Cal., in charge of the substations and overhead maintenance of way.

Mr. Franklin A. Smith, Jr., secretary of the Providence & Danielson Railway, Providence, R. I., has been elected treasurer of the Sea View Railroad, Wickford, R. I., to succeed Mr. A. L. Smith, Bridgeport, Conn.

Mr. C. H. Burnett, formerly manager of the Los Angeles & Redondo Railway, Los Angeles, Cal., has been appointed manager of outside properties of the Pacific Electric Railway, Los Angeles, Cal., and consolidated properties.

Mr. Ernest Gonzenbach, president of the Sheboygan Railway & Electric Company, Sheboygan, Wis., sailed for Europe on March 7, 1911, on a trip to Switzerland, his native country. Mr. Gonzenbach expects to be gone about four weeks.

Mr. J. W. Giltner has been appointed assistant claim agent of the Portland Railway, Light & Power Company, Portland, Ore. For the last four years Mr. Giltner has been connected with the claim department of the Indiana Union Traction Company, Anderson, Ind.

Mr. H. U. Wallace, vice-president of the Fort Dodge, Des Moines & Southern Railroad, Boone, Ia., assumed the duties of general manager of the company on March 1, 1911, on which date the resignation of Mr. J. L. Blake as general manager and traffic manager of the company became effective.

Mr. C. H. Crooks has been appointed traffic manager of the Fort Dodge, Des Moines & Southern Railroad, Boone, Ia. Mr. Crooks was formerly in the division freight and passenger office of the Chicago, Milwaukee & St. Paul Railway, at Des Moines. About three years ago he was appointed general freight and passenger agent of the Fort Dodge, Des Moines & Southern Railroad, in which office he made an excellent record.

Mr. Calvin Whiteley, Jr., has been appointed assistant chief engineer of the United Railways & Electric Company, Baltimore, Md. Mr. Whiteley has been chief engineer of the Virginia Railway & Power Company, Richmond, Va., for the last 11 years. Prior to his connection with the Virginia Railway & Power Company Mr. Whiteley was associated with the Western Maryland Railroad as engineer in charge of construction on work in southern Pennsylvania. He was also at one time employed as division engineer by the Baltimore Traction Company, one of the constituent companies of the United Railways & Electric Company.

Mr. Walter L. Fisher, special traction counsel to the City Council of Chicago and a member of the Railroad Securities Commission appointed by President Taft to consider the feasibility of regulating stock and bond issues of railroads, was appointed Secretary of the Interior by President Taft on March 7, 1911, to succeed Mr. Richard A. Ballinger, resigned. Mr. Fisher was born in Wheeling, W. Va., on July 4, 1862, and was graduated from Hanover College, at Hanover, Ohio. Four years after his graduation Mr. Fisher was admitted to the bar and began practice in Chicago. In 1889 he became special assessment attorney of the City Council of Chicago and was connected with the Department of Public Works. Mr. Fisher's connection with traction problems in Chicago began during the last year of Mayor Dunne's administration. In 1907 Mayor Dunne appointed Mr. Fisher special traction counsel to the City Council. Mr. Fisher drafted the street railway ordinances under which the Chicago City Railway and the

Chicago Railways operate and prepared the Mueller Law of Illinois, which legalizes municipal ownership of street railways.

Mr. Lewis C. Bewsey, whose appointment as local superintendent of the Indiana Union Traction Company at Indianapolis, Ind., was noted in the *ELECTRIC RAILWAY JOURNAL* of Feb. 25, 1911, was born in Colfax, Ind., on Jan. 26, 1882. After completing a high school education at an early age, Mr. Bewsey applied for a position as motorman on the Lafayette Street Railway, but because of his youth he was assigned to track work. He was next employed as a shop hand on repair work. Subsequently he was made a motorman and then a conductor. In 1905 he was promoted to shop foreman, but he resigned this position to become a motorman with the Indiana Union Traction Company in Muncie, Ind., in which capacity he served for more than six years. During a portion of the time he was employed as a motorman by the Indiana Union Traction Company he ran the Muncie Meteor between Muncie and Indianapolis, and from May 16, 1909, to Sept. 20, 1910, he did not miss a trip. During this period the car traveled 75,300 miles. Mr. Bewsey's exceptional operating record was referred to at a recent meeting of the Central Electric Railway Association.



L. C. Bewsey

OBITUARY

William B. Mason, president of the Mason Regulator Company, Boston, Mass., is dead.

Jerome W. Campbell, who was superintendent of the City & Suburban Railway, Portland, Ore., before that property was taken over by the Portland Railway, Light & Power Company, is dead. Mr. Campbell was born in Hocking County, Ohio, on Aug. 20, 1859, and settled in Portland in 1886. Shortly thereafter he became connected with the Willamette Bridge Railway and subsequently entered the service of the City & Suburban Railway.

The Industrial Safety Association is the title of a new association which has recently been organized with headquarters at 29 West Thirty-ninth Street, New York. Its objects, as stated in its constitution, are to "prevent accidents to life, limb or body of persons engaged in productive industry, or in the occupations contributory thereto in which mechanical or other sources of power are employed; and to promote the health and well-being of persons engaged in the wage-earning processes and other occupations of life, by disseminating knowledge of sanitation and hygiene."

The officers for the first year are: President, F. R. Hutton, consulting engineer, Department of Water, Gas and Electricity, New York City, and past-president American Society of Mechanical Engineers; vice-presidents, T. Commerford Martin, secretary National Electric Light Association, and past-president American Institute of Electrical Engineers; Charles Kirchoff, consulting mining engineer, and Henry R. Towne, president Yale & Towne Manufacturing Company; managers, Philip T. Dodge, president Mergenthaler Linotype Company; Frank E. Law, vice-president Fidelity & Casualty Company; Arthur Williams, electrical engineer, New York Edison Company, and Ira H. Woolson, consulting engineer, National Board of Fire Underwriters; treasurer, Robert A. Franks, president Home Trust Company; secretary, William J. Moran, counsel.

The association is conducting a museum of safety devices in the Engineering Societies Building and has just commenced the publication of a monthly paper. The annual dues are \$10.

The association also proposes to have a class of "contributing members" or manufacturing companies which will pay \$100 a year. This entitles them to an illustrated lecture on safety in their plant every year by one of the experts attached to the association.

Construction News

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

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

RECENT INCORPORATIONS

***Pequonnock Railway, Bridgeport, Conn.**—Application for a charter has been made in Connecticut by this company to build an electric railway between Bridgeport and Trumbull. Incorporators: C. Lewis Bill, Theodore B. Ford, F. B. Curtis and Leo C. Morehouse.

***Evansville & Chrisney Railway, Evansville, Ind.**—Incorporated in Indiana to build an interurban railway to connect Evansville, Chrisney, Troy and Tell City. Headquarters: Evansville. Capital stock, \$50,000. Incorporators: J. P. Chrisney, J. F. Bergaman, M. A. Abbott, S. W. Gwaltney, all of Chrisney, and E. E. Watts, Princeton.

***Henderson (Ky.) Interurban Railway.**—Incorporated in Kentucky as a subsidiary to the Fidelity Investment Company to build an electric railway to connect Henderson, Dixon, Providence, Morganfield, Uniontown and Owensboro. Capital stock, \$10,000. Incorporators: E. F. Wheaton and F. M. Smith, Nashville, and W. W. Cooper, Henderson.

***Winnipeg River Railway, Winnipeg, Man.**—Application for a charter has been made in Manitoba by this company to build a 65-mile electric railway from Winnipeg to Lac du Bonnet. H. P. Blackwell, Winnipeg, attorney.

***Jacksonville Traction Company, Boston, Mass.**—Application for a charter has been made in Massachusetts by this company. Capital stock, \$1,500,000. Incorporators: Frederick D. Webster, Erland F. Fish and Henry Endicott, Jr.

***Tri-State Railway & Electric Company, East Liverpool, Ohio.**—Incorporated in Ohio with a capital stock of \$10,000. Incorporators: W. R. W. Griffin, general manager of the East Liverpool Traction & Light Company; W. I. Shlep, F. J. Brady and W. B. Moore, Lisbon.

***Gallia & Meigs Electric Railroad, Gallipolis, Ohio.**—Incorporated in Ohio to build a 14-mile railway to connect Kanauga and Middleport. Rights-of-way are being secured and surveys made. Capital stock, \$50,000. Headquarters: Gallipolis. Incorporators: T. W. Jackson, of Belpre; S. H. Eagle, J. S. Howard, J. V. Lee and E. D. Davis, all of Gallipolis.

Pittsburgh, Butler, Slippery Rock, Grove City & Northern Street Railway, Butler, Pa.—Incorporated in Pennsylvania to build a 26-mile electric railway to connect Butler, Slippery Rock, Grove City, Prospect, West Liberty, Center, Franklin, Brady, North Liberty and Pine. Surveys have been made and franchises have been granted the company in a number of the towns. As soon as the rights-of-way have been secured construction will be begun. Incorporators: W. C. McCandless, John Troutman, F. L. Forrester, John C. Kerr and William M. Galbraith. [E. R. J., Feb. 18, '11.]

***Piedmont & Northern Railway, Greenville, S. C.**—Incorporated in South Carolina in connection with the plans of the Duke interests to operate a network of electric railways through the Piedmont section. Capital stock, \$5,000,000. Incorporators: J. B. Duke, Somerville, N. J.; B. N. Duke and Samuel McRoberts, New York City; W. S. Lee, Charlotte, N. C.; Ellison A. Smyth and Lewis W. Parker, Greenville, S. C.

FRANCHISES

Sacramento, Cal.—The Pacific Gas & Electric Company has received a franchise from the City Trustees to extend its railway over certain streets in Sacramento.

Vallejo, Cal.—The Vallejo & Northern Railway has received a 50-year franchise from the City Trustees to extend its railway along the waterfront to a terminal at the Main Street wall and over certain streets in Vallejo. T. T. C. Gregory, Suisin, president. [E. R. J., Feb. 25, '11.]

Macon, Ga.—The Macon Railway & Light Company has asked the City Council for a franchise to extend its railway over certain streets in Macon.

East Grand Rapids, Mich.—The Detroit, Lansing & Grand Rapids Railway, Detroit, has asked the Village Board for a

franchise to build its railway through East Grand Rapids. This proposed railway will connect Detroit and Grand Rapids. [E. R. J., July 9, '10.]

Lakewood, N. J.—The Trenton, Lakewood & Atlantic Railway, Trenton, has received a franchise from the Lakewood Township Committee to build its railway over Ocean Avenue, in Lakewood.

Belle Harbor, N. Y.—The Ocean Electric Railway, New York, has petitioned the Public Service Commission, First District, for permission to extend its line 8 miles through Belle Harbor to the property of the Neponsit Realty Company.

Brooklyn, N. Y.—The Brooklyn Rapid Transit Company has received a franchise from the Board of Estimate to extend its railway in Brooklyn along Georgia Avenue, between Liberty Avenue and Atlantic Avenue, and to connect its lines in Atlantic Avenue and Flatbush Avenue by a loop line through Flatbush, Fourth and Atlantic Avenues.

Buffalo, N. Y.—The International Traction Company has asked the Common Council for a franchise to extend its line in Abbott Road, between Cazenovia Street and City Line, in Buffalo.

New York, N. Y.—The Union Railway, New York, has received a franchise from the Board of Estimate to extend its railway across the Madison Avenue Bridge from Madison Avenue and 136th Street to East 138th Street and Exterior Street, in the Bronx.

Brantford, Ont.—The Brantford Street Railway has received a franchise from the City Council to extend its railway in Brantford to Holmedale.

Waynesburg, Pa.—The Waynesburg & Blackville Street Railway has received a 99-year franchise from the Borough Council. This proposed railway will connect Fairmont and Morgantown, W. Va., with Waynesburg and Pittsburg, Pa. Samuel Eakin, Wadestown, W. Va., president. [E. R. J., Aug. 27, '10.]

Wellsboro, Pa.—The Tioga Traction Company has asked the City Council for a franchise to build its railway over certain streets in Wellsboro. The line will connect Wellsboro, Middlebury, Chatham, Covington and Mansfield. Geo. F. Keagle, Avis, general manager. [E. R. J., April 16, '10.]

Montreal, Que.—The Montreal Street Railway has asked the Council for a 50-year extension of time on its franchise to build extensions in Montreal.

Providence, R. I.—The Pascoag & Providence Street Railway has asked the State Senate for a 3-year extension of time on its franchises in which to complete its railway in Providence. [E. R. J., March 2, '07.]

La Porte, Tex.—The Bay Shore Rapid Transit Company, La Porte, has received a 90-day extension of time on its franchise from the City Council to begin work on its projected railway to connect La Porte and Houston, via San Jacinto. O. L. Allen, La Porte, is interested. [E. R. J., Dec. 10, '10.]

TRACK AND ROADWAY

Ontario & San Antonio Heights Railroad, Ontario, Cal.—This company has completed and placed in operation its 7-mile extension between Pomona, North Pomona, Clairemont and Upland.

***Montezuma, Col.**—L. H. Long, Buffalo, representing the Automatic Transportation Company, Buffalo, N. Y., is said to have made preliminary arrangements for building a 12-mile elevated electric railroad from Montezuma to Keystone in Summit County. It will connect with the Colorado & Southern Railway at Keystone. Work will begin in the spring.

Oskaloosa Traction & Light Company, Oskaloosa, Ia.—This company has contracted with the Penn Steel Company for special work for track loops to be constructed in May.

Chicago (Ill.) Railways.—This company will build 10 miles of new track during 1911.

Dixon, Rock Falls & Southwestern Electric Railway, Tampico, Ill.—This company will construct 20 miles of track during 1911.

Capital Circuit Traction Company, Indianapolis, Ind.—This company advises that it will soon begin construction on its railway to connect Danville, Martinsville, Franklin,

Shelbyville, Greenfield, Noblesville and Lebanon. It will operate gasoline motor cars. Construction will be carried on under the supervision of John A. Shafer, chief engineer. [E. R. J., March 4, '11.]

Vincennes & Washington Transit Company, Vincennes, Ind.—About 20 miles of track will be constructed by this company during the present year.

Kentucky & Tennessee Traction Company, Hopkinsville, Ky.—This company will let contracts early in the spring for building its 25-mile electric railway to connect Hopkinsville, Salubria, Sulphur Mineral Springs, Pembroke, Trenton and Guthrie. There will be three steel bridges and one overhead railway crossing. Charles Venden Burgh, Hopkinsville, general manager. [E. R. J., Feb. 4, '11.]

Paducah (Ky.) Traction Company.—This company is preparing plans to build an extension to Mechanicsburg. A bridge will be built over Island Creek.

Aroostook Valley Railroad, Presque Isle, Me.—This company will construct a 12-mile extension from Washburn to New Sweden during 1911.

Wahpeton-Breckenridge Street Railway, Breckenridge, Minn.—This company is making plans to build an extension from Wahpeton to Hankinson and other points southwest of Wahpeton.

St. Louis, Lakewood & Grant Park Railway, St. Louis, Mo.—This company will begin on March 20 to build a 3-mile extension in St. Louis.

Missoula (Mont.) Street Railway.—About 2 miles of new track will be constructed in Missoula by this company during 1911.

Beatrice, Neb.—The Commercial Club, Beatrice, is considering plans for building a 44-mile electric railway from Adams to Diller via Beatrice.

Pine Brook Electric Railway, Caldwell, N. J.—The incorporators of this company have decided to equip this railway with storage battery cars. This proposed 10-mile railway will connect Caldwell and Denville. [E. R. J., March 4, '11.]

Fonda, Johnstown & Gloversville Railroad (Elec. Div.) Gloversville, N. Y.—About 4 miles of track will be constructed in Amsterdam by this company during 1911.

Liberty & Jeffersonville Electric Railway, Liberty, N. Y.—This company will place contracts during the next few months for building 12 miles of track. William Craig, Orange, N. J., president.

Westchester Electric Railroad, Mount Vernon, N. Y.—This company will place contracts during the next month for building one mile of single track in New Rochelle.

Interborough Rapid Transit Company, New York, N. Y.—The contract for 5000 tons of steel rails has been awarded by this company to the Lackawanna Steel Company. The order will be divided into 3000 tons of 100-lb. standard and 2000 tons of 90-lb. standard rails.

Dayton, Covington & Piqua Traction Company, Dayton, Ohio.—This company will build a double track on North Main Street, Dayton, from Fairview Park to the corporation line.

Lancaster-Buckeye Lake Traction Company, Lancaster, Ohio.—This company advises that it will begin construction about June 1. No contracts will be awarded until the company is organized. It will be incorporated as soon as the preliminary arrangements are completed. The line will connect Lancaster, Pleasantville, Thurston, Baltimore, Basil, Millersport and Buckeye Lake, 18 miles. Capital stock proposed, \$200,000. Bonds proposed, \$100,000. The power station will be located at Pleasantville and the repair shops at Lancaster. Officers: John H. Littrell, Lancaster; F. P. Barr, Lancaster, secretary, and C. W. Rowlee, treasurer. [E. R. J., March 4, '11.]

Oregon Electric Railway, Portland, Ore.—It is reported that this company has closed a contract with the General Railway Signal Company, Rochester, N. Y., for installing about 25 automatic block signals to protect trains on those portions of its tracks having the densest traffic.

Corry & Columbus Street Railway, Corry, Pa.—This company will build 3 miles of new track in Corry.

Southern Cambria Railway, Johnstown, Pa.—Sheesley & Son, Ebensburg, have been awarded the contract by this company for grading the extension from Brookdale to Ebensburg.

Mahoning & Shenango Railway & Light Company, New Castle, Pa.—The directors of this company have decided to issue bonds to the extent of \$500,000, which will be used for improvements over the entire railway from Leavittsburg to Youngstown and New Castle. The greater part will be spent in building extensions and double-tracking the existing lines in Youngstown.

Montgomery County Rapid Transit Company, Norris-town, Pa.—This company will extend its railway from Skippack, the present terminus, to points along the Perkiomen Valley instead of the North Penn Valley.

***Montreal, Que.**—It is reported that a syndicate is being formed to build a 14-mile elevated railway extending along Craig Street and St. James from the western to the extreme eastern limits of Montreal.

Regina Municipal Railway, Regina, Sask.—Construction will begin on this 6-mile railway in Regina as soon as the weather permits. The city commissioner says the proposition is financed on the security of vacant property owned by the city to the amount of \$400,000. The power station and repair shops will be located in Regina. It will operate six cars and will furnish power for lighting. A. J. McPherson, Regina, city commissioner, and L. A. Thornton, Regina, city engineer. [E. R. J., March 26, '10.]

Bryan College Interurban Railway, Bryan, Tex.—About a mile of new track will be built by this company in Bryan during 1911.

Texas Traction Company, Dallas, Tex.—This company, now operating an interurban line from Dallas to Denison, will begin at once the construction of an extension to Waxahachie, Hillsboro and Waco.

Bonita Valley Rapid Transit Railway, Jourdanton, Tex.—Preliminary plans are being made by this company to build its proposed railway between Jourdanton and Pleasanton. C. S. Young, San Antonio, is interested. [E. R. J., Nov. 19, '10.]

Norfolk & Portsmouth Traction Company, Norfolk, Va.—This company has placed contracts for rebuilding its tracks on Botetourt Street and Olney Road with T-rails and vitrified brick pavement.

Richmond & Henrico Railway, Richmond, Va.—The Virginia Bridge & Iron Company, Roanoke, has been awarded a contract by this company for the steel work of its new viaduct. This new bridge will be 50 ft. overhead and will span 1200 ft. from Marshall Street and the National Cemetery Road to Nicholson Street, Fulton. Work will be begun at once. The cost is estimated to be about \$50,000. W. S. Forbes, president. [E. R. J., Oct. 8, '10.]

Spokane & Inland Empire Railroad, Spokane, Wash.—This company expects to build 65 miles of single track during 1911.

Tacoma Railway & Power Company, Tacoma, Wash.—About 2 miles of new track will be built by this company in Tacoma during 1911.

Middle Island Railroad, Middlebourne, W. Va.—This company has awarded the contract to Shumway & Dean, Pittsburgh, for building the first 14 miles of track between Middlebourne and Curtis of its proposed 60-mile electric railway to connect Sistersville, Kidwell, Middlebourne, Shirley and Clarksburg. John F. Shore, Middlebourne, secretary. [E. R. J., Nov. 5, '10.]

Badger Railway & Light Company, Milwaukee, Wis.—This company has received a certificate of convenience and necessity and will begin work on its proposed 22-mile electric railway between Lake Geneva and Whitewater via Elkhorn as soon as the weather permits. Gustav Pickhardt, chief engineer, 711 Majestic Building, Milwaukee. [E. R. J., Dec. 31, '10.]

SHOPS AND BUILDINGS

Mason City & Clear Lake Railway, Mason City, Ia.—This company advises that the fire which recently destroyed its car house at Mason City caused a loss of about \$5,000,

and that none of the cars were totally destroyed. [E. R. J., March 4, '11.]

Frederick (Md.) Railroad.—It is said that this company will soon build a new passenger and freight station in Frederick.

Union Street Railway, New Bedford, Mass.—This company will place contracts soon for building an addition to its car house (70 ft. x 245 ft.) on Pope's Island, New Bedford. E. S. Wilde, New Bedford, purchasing agent.

Liberty & Jeffersonville Electric Railway, Liberty, N. Y.—This company advises that during the next few months it will place contracts for building a new car house and offices in Liberty. William Craig, Orange, N. J., president.

Ohio Electric Railway, Cincinnati, Ohio.—This company has completed and opened its new station in Dayton. It is built of brick, three stories high, and cost about \$150,000. The offices of the company will be located in the building.

Scioto Valley Traction Company, Columbus, Ohio.—This company has purchased a site in the business section of Chillicothe for a new depot, and will secure two other pieces of land adjoining. A station with train shed will be erected, the work to begin as soon as the titles to the land are perfected. The cost of the depot and land will be about \$40,000.

Portland Railway, Light & Power Company, Portland, Ore.—This company is considering plans for building new car houses on Jessup Street, between Mississippi Avenue and Missouri Avenue, in North Albina. The buildings will be of brick construction, and the cost is estimated to be about \$30,000.

Hull (Que.) Electric Railway.—This company will place contracts during the next six weeks for building a new car house at Deschenes.

POWER HOUSES AND SUBSTATIONS

New London & East Lyme Street Railway, New London, Conn.—This company has completed and placed in operation its new power station at Saybrook.

Kentucky & Tennessee Traction Company, Hopkinsville, Ky.—This company will soon award contracts for building a power house and substations for its railway. Charles Vanden Burgh, Hopkinsville, general manager. [E. R. J., Feb. 4, '11.]

Springfield (Mass.) Street Railway.—The Westfield division of this company has completed and placed in operation an addition to the power plant in Westfield. An extension has been added to the buildings on Emery Street and a 500-hp engine and a 225-kw generator added.

Buffalo, Lockport & Rochester Railway, Rochester, N. Y.—An additional stationary transformer with a capacity of 600 hp will be added to the Brockport substation by this company.

Ohio Traction Company, Cincinnati, Ohio.—This company, it is said, is considering plans for building a new power house at Pendleton.

Oakwood Street Railway, Dayton, Ohio.—This company is considering plans to build a new power house, probably on South Bowen Street, Dayton. H. P. Clegg is general manager. The present power plant will probably be utilized as a car house.

Mt. Hood Railway & Power Company, Portland, Ore.—This company has begun work on the superstructure of the steam auxiliary plant on the Peninsula in Portland. The main building will be 100 ft. x 80 ft. The plant will generate 4000 hp. The cost is estimated to be about \$100,000.

Frankford, Tacony & Holmesburg Street Railway, Tacony, Pa.—This company has placed contracts for two Murray boilers for its power plant at Tacony.

San Antonio (Tex.) Traction Company.—This company plans to spend \$250,000 on improvements which include new equipment and double tracks in its power house at San Antonio.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis.—This company advises that during the next month it will purchase one 300-kw motor generator set for its power plant at Eau Claire. George B. Wheeler, Eau Claire, general manager.

Manufactures & Supplies

ROLLING STOCK

Somerset Traction Company, Skowhegan, Me., expects to purchase one snow plow.

Great Falls & Old Dominion Railroad, Washington, D. C., is in the market for six passenger cars.

Montreal (Que.) Street Railway is reported as being in the market for 50 pay-as-you-enter cars.

Kankakee (Ill.) Electric Railway has ordered two passenger cars from the St. Louis Car Company.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont., is in the market for six single-truck cars.

Texas Traction Company, Dallas, Texas, it is reported, is in the market for two high-power gasoline motor cars.

Boston (Mass.) Elevated Railway has placed an order with the Pressed Steel Car Company for 20 steel elevated cars.

Springfield (Mass.) Street Railway has ordered three 14-bench open car bodies from the Wason Manufacturing Company.

Mason City & Clear Lake Railway, Mason City, Ia., expects to purchase five double-truck passenger cars and one large express car.

Portland Railway, Light & Power Company, Portland, Ore., has ordered 50 28-ft pay-as-you-enter cars, from Pierson, Roeding & Company.

Frederick (Md.) Railroad has placed an order with The J. G. Brill Company for one 30-ft. electric locomotive, mounted on Brill 27-M.C.B.-1 trucks.

Wilkes-Barre & Luzerne Railway, Wilkes-Barre, Pa., has purchased 20 passenger car bodies mounted on Brill 27-E trucks, from The J. G. Brill Company.

Sheridan Railway & Light Company, Sheridan, Wyo., has ordered three 21-ft. closed cars, mounted on Brill 21-E trucks, from the American Car Company.

Stroudsburg & Water Gap Street Railway, Stroudsburg, Pa., has ordered three 12-bench open cars, mounted on Brill 27-G trucks, from The J. G. Brill Company.

Omaha & Council Bluffs Street Railway, Omaha, Neb., has ordered 25 29-ft. 4-in. closed cars, mounted on Brill 39-E trucks, from the American Car Company.

Oakland & Antioch Railway, Antioch, Cal., has placed an order with the American Car Company for one 45-ft. baggage and express car, mounted on Brill 27-M.C.B. trucks.

Toledo & Chicago Interurban Railway, Kendallville, Ind., is in the market for two trailer freight cars, to be not less than 40 ft. long and equipped with M.C.B. radial couplers and automatic air brakes.

North Jersey Rapid Transit Company, Paterson, N. J., noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 21, 1911, as being in the market for two passenger cars, has ordered these cars from the Jewett Car Company.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y., has placed an order with the Cincinnati Car Company for five 43-ft. prepayment cars. These cars will be equipped with Brill 39-E trucks and GE-87-A motors with K-36 control.

Ohio Electric Railway, Cincinnati, Ohio, has ordered nine 61-ft. 6-in. four-motor passenger cars, three 60-ft. two-motor excursion passenger cars, two 60-ft. trail excursion cars and 12 40-ft. freight trail cars from the Cincinnati Car Company.

TRADE NOTES

Ohio Seamless Tube Company, Shelby, Ohio, has increased its capital stock from \$350,000 to \$1,000,000.

Wendell & MacDuffie Company, New York, N. Y., has been appointed sole Eastern agents for the St. Louis Car Company.

Standard Paint Company, New York, N. Y., has removed its Chicago office to the People's Gas Building at 150 Michigan Avenue.

Lindsay Brothers Company, Spokane, Wash., has removed its Chicago office from the Monadnock Building to the Fisher Building.

Fred Collins has recently accepted a position with the Dearborn Drug & Chemical Works, with offices at 229 Broadway, New York, N. Y.

Wonham, Sanger & Bates, New York, N. Y., have received an order to equip all cars of the Montreal Street Railway with "H. B." life guards.

Murphy Varnish Company, Newark, N. J., has increased its stock from \$2,500,000 to \$3,000,000 by increasing the amount of 6 per cent cumulative preferred stock from \$1,000,000 to \$1,500,000.

Chicago Pneumatic Tool Company, Chicago, Ill., at the last meeting of its board of directors re-elected the retiring directors, with the exception of J. W. Duntley, who is succeeded by J. H. Ward.

Poole Brothers, Chicago, Ill., have made an announcement of the consolidation of Poole Brothers and the Corbitt Railway Printing Company. The business will hereafter be conducted under the name of Poole Brothers.

Allis-Chalmers Company, Milwaukee, Wis., has appointed W. R. Crawford in charge of the railway department of the Chicago office. Up to this time Mr. Crawford has been connected with the Cooper Heater Company, Carlisle, Pa.

Ackley Brake Company, New York, N. Y., has recently supplied a large number of Ackley adjustable brakes to car manufacturers in Ammendorf, Wismar, Coblenz, Cologne and Budapest for European tramways through its Berlin agency.

Phoenix Iron Works Company, Meadville, Pa., announces the appointment of W. H. Bastable as district sales agent. Mr. Bastable, who has been for a number of years with the Franklin Boiler Works Company, will hereafter be located at 135 William Street, New York, N. Y.

United States Steel Corporation, New York, N. Y., has appointed Percival Roberts a member of the finance committee, succeeding W. E. Corey. Mr. Roberts was president of the American Bridge Company, New York, N. Y., when it was taken over by the steel corporation.

Hayes Track Appliances Company, Geneva, N. Y., has started the construction of a new factory, to be located at Richmond, Ind. The company intends to close the Geneva plant and to occupy the new one about April 1, 1911. This change is made to secure a location nearer the center of demand.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has ordered 3000 tons of structural steel from the American Bridge Company, to be used in the building of two new foundries at Trafford City. The company has purchased 30 acres near Trafford City, and it is planned to have all castings made at these foundries.

Pennsylvania Railway Motor Company, Warren, Pa., has recently completed a number of tests on the new "Veile" motor car, which have proved very satisfactory. The car, which is capable of developing 250 hp, was designed by J. A. Veile. Within the next few months the company intends to have its plant in operation, in which at least 100 men will be employed, turning out one car a month.

Chicago Varnish Company, Chicago, Ill., has announced the appointment of George G. Porter as Eastern representative of that company. Mr. Porter was formerly master mechanic of the New Jersey & Hudson River Railway & Ferry Company, Edgewater, N. J., and has recently been connected with J. G. White & Company. A biography of Mr. Porter was published in the *ELECTRIC RAILWAY JOURNAL* of Nov. 12, 1910.

W. R. Hulburt, of the Goldschmidt Thermit Company, New York, N. Y., delivered two lectures in Cleveland, Ohio, on March 7, 1911, on the methods and uses of the Thermit process of welding, one before the Cleveland branch of the American Chemical Society and the other before the University School of Cleveland. The thermit reaction was demonstrated before both audiences and lantern slides were used to show the various methods of applying Thermit.

Boss Nut Company, Chicago, Ill., announces that it has acquired complete rights to the "Boss" nut from B. M. Osburn Company. The nut has been extensively used on railway equipment throughout the country and also has been widely used on special crossing work. The officers of the company are Charles G. Hawley, president; B. M.

Osburn, vice-president and treasurer, and John R. Lefeore, secretary.

American Ship Windlass Company, Providence, R. I., has received an order from the Boston Elevated Railway for 16 seven-retort Taylor underfeed gravity stokers to be installed under a battery of 600-hp Babcock & Wilcox boilers in the new power station at South Boston which is now under construction. Stone & Webster Engineering Corporation is in charge of the engineering work on the new station.

Westinghouse Lamp Company, Bloomfield, N. J., has received large orders from the Pennsylvania Railroad for \$70,000 worth of lamps, the Harriman Lines for \$140,000 worth and from the Schoepf-McGowan interests, which control the Ohio Electric Railway and other properties, for \$35,000 worth of lamps. This company also reports that it has recently added the 40-watt and the 60-watt sizes to its line of wire-type tungsten lamps.

Nickel-Chrome Chilled Car Wheel Company, Newark, N. J., has been incorporated for the purpose of furnishing nickel-chrome alloy to makers of chilled car wheels. The officers of the company are: Robert C. Totten, president and treasurer; Stephen D. Barnett, vice-president and general manager, and Charles A. Millington, secretary. The New York office of the company is in the Hudson Terminal Building and the Pittsburgh (Pa.) office in the Frick Annex.

British Thomson-Houston Company, Ltd., Rugby, England, has made arrangements with Rud. Chillingworth, of Nürnberg, Germany, for the exclusive sale of the Chillingworth patent pressed steel gear cases in the United Kingdom and for export therefrom. All inquiries sent to Rud. Chillingworth at Nürnberg, or to his representatives in the United Kingdom, for the use or sale of these gear cases in Great Britain and Ireland should in future be addressed to the British Thomson-Houston Company, Ltd., Rugby, or to its branch offices.

Railway Improvement Company, New York, N. Y., manufacturer of the Hedley coasting registers, has just closed an important contract with the Hudson & Manhattan Railroad for the sale of its coasting registers. The Hudson & Manhattan Railroad operates the McAdoo tubes under the Hudson River and has recently concluded an exhaustive test of the Hedley coasting register, similar to that used on the elevated and subway lines in New York. These tests showed a possible saving of 25 per cent in the kilowatt-hours per car mile required in the Hudson tunnel line. As a result the Hudson & Manhattan Railway has ordered enough coasting registers to equip all of its cars. These registers will be installed and put into operation immediately.

Hicks Locomotive & Car Works, Chicago, Ill., noted in the *ELECTRIC RAILWAY JOURNAL* of March 4, 1911, as having been purchased by Col. William Barbour, president of the Linen Thread Company, have been reorganized by Mr. Barbour and his associates. The name of the new organization is to be the Central Locomotive & Car Works, with offices in the Fisher Building, Chicago, Ill. The company intends to make many improvements to the plant at Chicago Heights, consisting of new machinery and tools and will make a specialty of building new passenger coaches, freight equipment, rebuilt passenger cars, freight cars and locomotives. The officers of the new organization are: William McInnes, president and general manager; A. M. Gardner, vice-president; William Barbour, treasurer; C. B. Bruce, secretary, and A. M. Hicks, purchasing agent.

Railway Steel-Spring Company, New York, N. Y., has elected Otis H. Cutler, president of the American Brake Shoe & Foundry Company, a director to succeed Frank H. Layng, whose death was announced in the *ELECTRIC RAILWAY JOURNAL* of March 4, 1911. Charles Scott, Jr., has been elected a member of the executive committee of the company. The members of the executive committee who were re-elected are William M. Barnum, F. F. Fitzpatrick, Charles Miller and Waldo H. Marshall. The company reports gross earnings for the year ended Dec. 31, 1910, of \$10,035,435; net earnings of \$1,950,000, and a balance of \$810,077 after the payment of interest on its Latrobe bonds and dividends of 7 per cent on the preferred stock. The balance sheet as of Dec. 31, 1910, shows total assets of \$35,085,884 and total liabilities of \$35,085,884. The value of the plant as given is \$30,267,235.

ADVERTISING LITERATURE

Crocker-Wheeler Company, Ampere, N. J., has issued Bulletin No. 126, on "Polyphase Induction Motors."

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued sheets 16-A and 66 of series 336, describing respectively "Rope Drive and Conveyor Sheaves" and "Angular (Radial) Bearings."

Platt Iron Works Company, Dayton, Ohio, has issued Bulletins Nos. 549, 553 and 555, illustrating and describing Smith-Vaile air compressors, Victor-Francis turbines and Smith-Vaile boiler feed-pumps.

Titanium Alloy Manufacturing Company, Pittsburgh, Pa., has issued a small booklet on "Titanium in Steel." Among other interesting articles in this booklet is one on "The Effect of Titanium Alloy in Relation to Slags."

Railway Improvement Company, New York, N. Y., has printed a folder entitled "Service Stripes vs. Brains." This folder shows the advantages of the coasting time recorder, which measures the amount of time that a motorman runs a car under its own momentum.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has recently issued catalog sections Nos. 228, 229, 553, 731 and 735 on the following subjects: "Inclosed Fuse Blocks," "Subway Fuse Boxes," "Automatic Voltage Regulators," "Instrument Transformers" and "Type S and SA Distributing Transformers."

J. G. Brill Company, Philadelphia, Pa., has issued the "Brill Magazine" for February, 1911, which contains a biographical sketch of Andrew W. McLimont, vice-president and general manager of the Michigan United Railway. The sketch is accompanied with an excellent portrait of Mr. McLimont as a supplement. Among the feature articles are the following: "Conditions Which Govern the Type of Car for City Service, Pittsburgh, Pa.," "Cars for New Line Between St. Joseph and Savannah, Mo.," "Interurban Cars for Eastern Pennsylvania," "Prepayment Cars for the Omaha & Council Bluffs Street Railway," "Cars for St. Louis Water Works Line," "Steel Underframes for City Cars" and Part II of "A History of The J. G. Brill Company."

Burton W. Mudge & Company, Chicago, Ill., have recently published an attractive booklet of 32 pages descriptive of typical installations of Garland ventilators as applied to steam and electric cars. In the section devoted to electric cars illustrations are given of the rolling stock of the South Side Elevated Railroad, Chicago, Bessemer & Lake Erie Traction Company, Joliet & Southern Traction Company, Detroit United Railway, West Penn Traction Company, and the Metropolitan Street Railway of Kansas City. The views of the cars of these roads illustrate the application of Garland ventilators to the monitor-type roof with deck sash and to the turtle-back roof with its smooth arched surface. The ventilators fit the slope of the roof and do not detract from the appearance of the car exterior. Special shutters make possible the adjustment of the ventilation. On some of the cars air intakes have been located in the floor under the electric heaters, thus providing for natural circulation of fresh air upward through the heaters and thence, when vitiated, out through the Garland ventilators located on the roof.

NEW PUBLICATION

How to Avoid Accidents. By J. H. Handlon, claim agent United Railroads of San Francisco. 24 pages, illustrated. Price for a single copy, 10 cents.

In this little pamphlet Mr. Handlon has compiled some very effective material for an electric railway anti-accident campaign. It is based on the theory that the carefulness of one person sometimes offsets the carelessness of another. The pamphlet is illustrated with 12 pen-and-ink sketches showing the most common forms of accidents on electric railways and the text describes these accidents and the way in which the motorman or conductor might possibly have prevented them, even though the person injured was grossly careless. Copies have been placed in the hands of each of the platform men on the United Railroads of San Francisco and they are also printed for general sale in small or large lots.