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CONTENTS.

Proposed Increase in Second-Class Postal Rates

All subscribers to this paper should be concerned in the amendment to the post office appropriation bill which is now before the United States Senate and is attracting wide attention. This amendment increases from 1 cent to 4 cents per pound the postal rates on the advertising pages of popular magazines and of technical and trade journals (which have little or no political influence), but leaves at the old rate the great daily papers, with their enormous Sunday editions and so-called magazines, and the very small publications whose mailings amount to 4000 lb. or less per issue. As this change, if enacted, would seriously affect this paper as well as other technical and trade publications and would probably drive some journals out of business, we feel that we should briefly refer to the subject. The ELECTRIC RAILWAY JOURNAL is perfectly willing to pay what it should, as a good citizen, to meet the needs of the government. But it believes that Congress will see the unfairness of attempting to make up by such an enormous increase in charges upon one class of papers the deficit caused by the rural free delivery system, from which the publishers of most technical papers derive little or no benefit. A more equitable plan would be to stop the abuse of the franking privilege through which the government now sustains a large loss or else to adopt a slightly higher charge for second-class mail matter, to apply to all periodicals alike.

Popular Finance

The great interest being felt in New York over the rapid transit situation has led to many heated editorials and articles in the metropolitan press in which the writers have displayed a better knowledge of rhetoric than of the exact condition of affairs. Some of the statements relating to the profits earned by the present subway are especially amusing, irrespective of whether one believes that the interests of the city would better be served if the contract for the new rapid transit system should be awarded to the Interborough Rapid Transit Company or to an independent operator. Thus, a morning paper which claims to have one of the largest circulations, if not the largest, in the city solemnly says that the present subway has paid for itself in six years, and that, at the present rate of receipts, the entire construction cost would be covered in three and a half years. These statements would certainly be astounding if true, but an analysis of the accompanying figures shows the two errors into which the writer has fallen. In calculating the receipts of the subway he confused the gross revenue with the net income, a difference, for last year, equivalent to that between nearly $14,000,000 and $4,641,000. Moreover, he made no allowance for the cost of equipping the line with its power station, cars,

etc., of organizing the company, or of starting it as a going concern. This expense was nearly as much as that of building the subway itself. We have heard of some economists who believe in valuating a railway property at the sale price of its physical equipment, but it is certainly a very long step in advance of any which has yet been taken to eliminate everything except the right-of-way. If the writer of the paragraph mentioned will show the managers of the Interborough Rapid Transit Company how they can maintain their present gross receipts without paying out anything for operating expense or as interest on the cost of the equipment we believe that the managers of the road would be willing to admit that the cost of constructing a subway could be refunded in a very short time. Under these circumstances almost any business—even that of publishing newspapers—would be profitable.

Committees on Safety

Most of the accidents which are of daily occurrence on railways, in mines, factories, and in fact in nearly every industrial occupation, are the result of failure on the part of some one to observe rules made for the express purpose of preventing such accidents. Familiarity with the dangers of the day's work breeds contempt for them. The ironworker takes risks at the top of a skyscraper that make the pedestrian on the street shudder. The miner handles high explosives with careless abandon, and the motorman runs his car at high speed without thought of the danger to himself, his passengers or any one else. It is a most difficult task to make a large body of men realize individually and collectively the ever-present danger of their occupation, which involves risk not only to themselves but to their fellow-workmen and others whose safety depends on the close observance of all precautionary rules. Any campaign for the prevention of accidents, to be successful, must strike at the root of the trouble, which is the indifference of the employees and the public to danger. The Chicago & Northwestern Railway has attempted such a campaign, along new lines, through the formation among the employees of committees on safety. On each division of the system a committee composed of engineers, conductors, brakemen, switchmen, firemen, trackmen, shopmen and station employees has been organized. These committees make regular tours of inspection over each division. Dangerous conditions which can be corrected readily are righted at once on the recommendation of any member of the committee. Unsafe conditions of a general character are reported promptly, with recommendations to a Central Safety Committee, composed of operating and general officers of the company. The central committee acts at once to have the danger reduced or eliminated, and every division committee is notified of any action taken. As a badge of authority and to designate his office, each member of the safety committee wears a neat button in the lapel of his coat on which are the words "Safety First," which is the slogan adopted for carrying out the movement. The good points of this plan of enlisting representative employees to supervise the movement in each locality and spread the doctrine of safety will be recognized by every manager. No one man, however enthusiastic and earnest he may be, can accomplish as much in a movement of this kind as 50 or 100 men, each imbued with a sense of personal responsibility for its success. These men on the job will see many things that the manager or superintendent never sees; they can sow seeds of caution in the most fertile ground.

POWER TRANSMISSION FOR RAILWAYS

The paper by W. B. Jackson, read on Feb. 10 at the meeting of the American Institute of Electrical Engineers, on the "Advantages of Unified Electric Systems" calls renewed attention to the large number of long-distance transmission systems now supplying power to electric railways of various descriptions. In part this supply is the natural result of the development of transmission from hydraulic sources and in part it is due to the initiative of the railways themselves in organizing high-voltage systems for their own use over wide areas. As the electrification of the larger railway systems draws, as one may say, not nearer but to a less hopeless distance, the necessity for long transmissions, either from coal at the tidewater or at the mines or from hydraulic sources, becomes more and more evident. Electrification in the larger sense is chiefly a matter of power transmission. The beginnings of electric railway operation from transmitted power are not distant and the results already accomplished make the path of progress plain. The first electric railway to use electric power transmitted at what was then high tension from a hydroelectric station was the Norwich (Conn.) street railway, which in 1894 began taking power from one of the very early three-phase transmissions, having its generating station at Baltic, Conn. In the 17 years that have passed since then power transmission has grown beyond the utmost dreams of its originators. Yet it is interesting to see consistently being worked out the plan of utilizing purchased and transmitted power thus first brought into use.

At the present time it is so easy to transmit electric power over very long distances that, save in rare cases, it does not pay to operate a large network of lines from scattered individual power houses. The more economical plan is to have one, or preferably two, large generating stations able to provide power more cheaply, first, on account of the relatively large output, and, second, on account of the very much improved load factor which can generally be obtained by centralization. And the question which must be asked by many railroads is whether, on the whole, it pays to generate the power locally if it can be obtained on reasonable terms from a transmission system. Take, for example, the common case which exists in many parts of the country, namely, a large number of roads in contiguous territory, but serving, in the main, different districts. They are separate roads financially, if not physically, and have grown up, if the usual course of events is followed, at different times and under different conditions. The *ensemble* from the larger viewpoint is a network of electric roads covering a large territory and supplied with power under extremely bad economic conditions from many small stations. Of course, if the roads could be merged it would not be difficult to make very material savings by centralizing the power supply, but it often happens that there are serious objections to an actual consolidation of the properties. Fortunately, this is not at all necessary to secure the object sought.

We are suggesting only the extension to, say, the State of Illinois of what is done now in the City of Chicago. Usually the stations would be built by independent power companies, but we see no reason why, where there is no such company in the field, the managements of the roads themselves should not get together and form a power transmission company to build power houses and the lines necessary to supply the various roads concerned, taking stock perhaps pro rata on the capitalization or on

the power demanded, so that all would share in whatever profits might accrue. This would seem to be a possible solution of the power difficulties in many cases where a merger would be undesirable or impossible. Or, in some cases, it might be a perfectly feasible matter to unite in building a transmission system and arrange the purchase of power from an existing central station or transmission plant from which better rates could be obtained for the power in a single block than individual companies could secure for themselves, owing to the certainty of a better load-factor. The functions of the railway power organization would then be reduced to upkeep of the lines and arranging an equitable scheme for the division and metering of the purchased current. A big central station already doing a large business and with complete equipment for power generation can, as a general rule, supply power more cheaply than individual railways can generate it, and it is better fitted to deal with the large output required for a group of railways than are the railways themselves, since on the whole it is easier for the central station with a large, profitable and established business to obtain the necessary capital upon favorable terms. Such form of co-operative generation or purchase of power would solve a good many outstanding difficulties connected with power supply to contiguous street railway systems.

When one considers the possibilities involved in the electrification of large railway systems a similar procedure would seem sometimes desirable. The generation and distribution of power form no inconsiderable part of the expense of electrification, which is so great as very naturally to stagger many roads that might otherwise like to undertake it. The figures we recently published concerning the possible electrification of the roads around Boston emphasize this phase of the matter. The fact is that many American railways have so far strained their borrowing capacities that the raising of $10,000,000, $20,000,000 or $40,000,000 for electrification of the service near termini is a very serious matter. And, upon the whole, as we intimated in discussing the Boston case, the public will not stand for an increase of suburban fares being charged to such electrification when the ordinary electric railway systems in the same territory are conducted at a profit on relatively much lower fares.

If, however, a railway system could undertake electrification knowing well that it would only have to pay for the upkeep of certain definite equipment and for power at a predetermined rate, its managers would be much more favorably disposed to the change than when they are confronted with the, to them, unknown cost and complication of a great generating and transmission system. On the other hand, a power company undertaking this work of generating and transmission would work for its part on known data, could estimate its costs from previous experience with a good deal of precision, and, with a long-term contract for power behind it, would find it easier to raise capital than would the railway itself, often already overburdened with securities. If it were possible to go a step further and purchase transmitted power from a company already existing and merely requiring added station capacity and appropriate lines, the problem would become still simpler. Centralization of all the power supply in any given territory has so many advantages that no general comment is needed on the subject. There is no reason why existing railways should not take full advantage of any source of power within their reach. In fact, there is every reason why they should, because it will greatly reduce power expenses and will simplify the operation especially of electrified steam railroads since it eliminates practically all of the special electrical problems and brings down the questions of operation practically to those involving transportation and traffic problems.

CHANGES DESIRED IN CLEVELAND ORDINANCE

The new Cleveland ordinance appears to have flaws which weaken its protection of the capital investment. In the report published in last week's issue of the ELECTRIC RAILWAY JOURNAL President Stanley, of the Cleveland Railway, discussed the criticisms made by bankers that the ordinance (1) failed to provide a sinking fund for the retirement of the valuation placed by Judge Tayler upon the old franchises and (2) seemed to permit the company to maintain newly acquired property at a value equal to only 70 per cent of its cost, but provided no sinking fund to take care of the 30 per cent depreciation that it was assumed the property would suffer. These questions arise when the new ordinance has been in effect for less than a year and hamper the company in its efforts to raise needed capital for additions and betterments. They exist notwithstanding the declared purpose of the ordinance to "secure to the Cleveland Railway Company, unimpaired, the capital value" which was fixed by the late Judge Tayler, of the United States Circuit Court of Cleveland, who acted as an arbitrator representing both the city and the company.

The remedy which is asked by the company is the right, by amendment of the ordinance, to maintain future additions and betterments at 100 per cent of their reproduction value by means of a reserve fund. This fund, as proposed, would provide for the 30 per cent depreciation which the additions and betterments suffer theoretically and instantaneously because of the interpretation which the ordinance now permits, that the property shall be maintained at, and shall be worth, an average of 70 per cent of reproduction value.

A requirement that a standard condition of 70 per cent should be maintained was contained in the rejected arrangement between the Cleveland Railway Company and the Municipal Traction Company created by Tom L. Johnson. It was designed originally to safeguard the former company, the owner of the property, against the possibility that the lessee company would allow the property to depreciate below 70 per cent of its value and thus render it of less value than that which it was assumed would be a reasonable standard for working condition. As the new ordinance superseded the old arrangement, this clause was continued so as to assure a fair average working condition of the property, but by the present legal interpretation it becomes a deranging query concerning capital value.

It was generally believed that the many phases of street railway war and franchise negotiation historical in Cleveland had been succeeded by an ordinance under which at least the capital value of the property would be protected beyond question. Since uncertainty exists, it is fortunate, of course, that the fact has been made public before further and extensive investments in the property became irrevocable. If the inducement for investment is to be limited to a reasonable rate of return, as is the intent of the Cleveland ordinance, there is no element of hope for speculative profit. For the absence of this element the city can compensate only by such measures as will safeguard as far as possible the principal invested.

ADDITIONS TO COMMERCE STREET POWER STATION, MILWAUKEE

The electrical generating capacity of the Commerce Street power plant of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., is being increased by the addition of two 14,000-kw, high-pressure turbine alternators and two 7500-kw, low-pressure turbine alternators, the latter utilizing the exhaust steam from the eight vertical cross-compound engines already installed. The new work involves the installation of very extensive and complete switching apparatus for the alternating-current section of the plant, including a number of interesting features embodying the most modern design and practice.

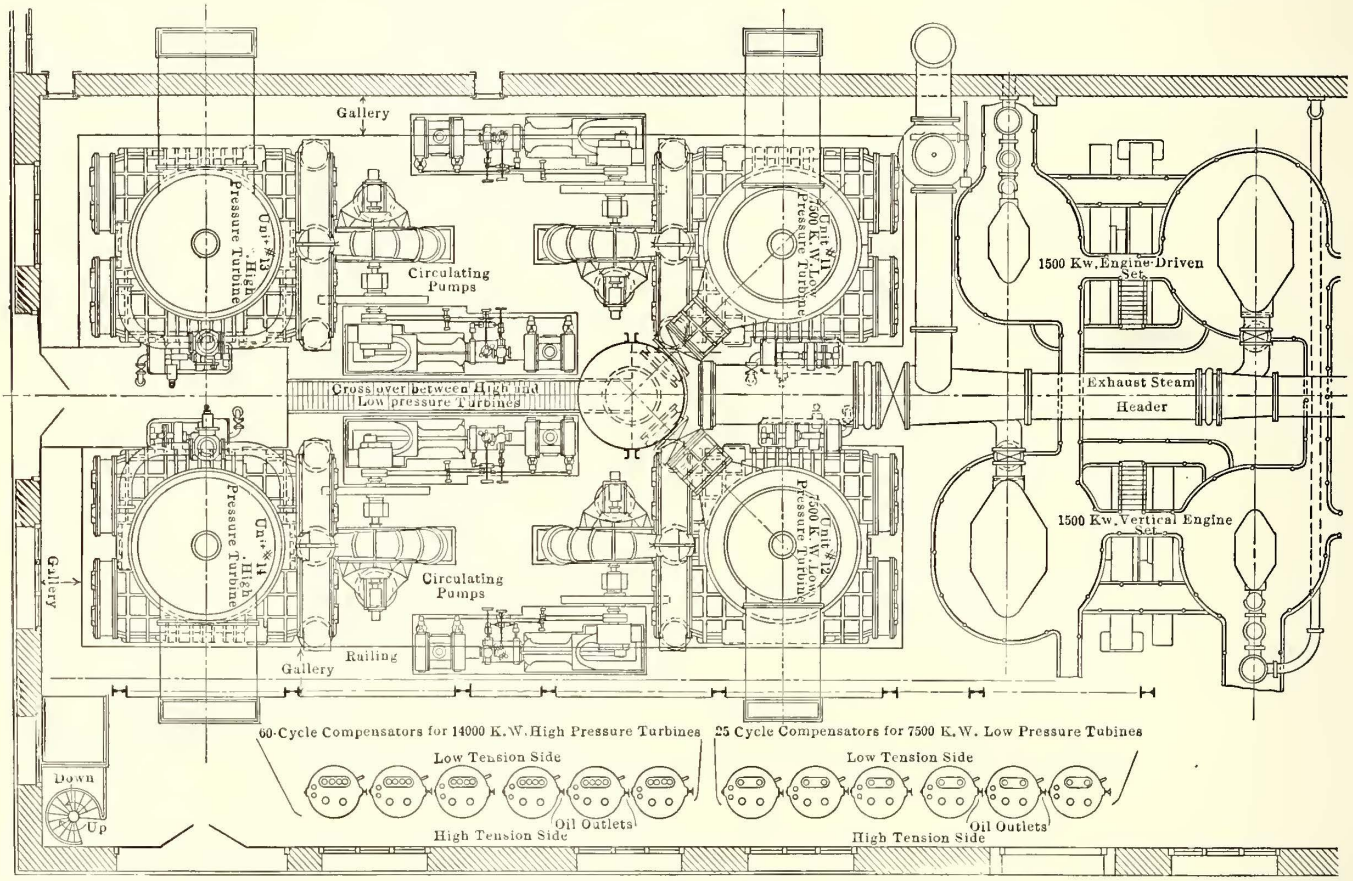
DEVELOPMENT OF THE PLANT

The construction of the original Commerce Street plant, with its engine-driven equipment, was commenced in 1902, at the time the steam turbine was first attracting the serious attention of engineers. The plant was therefore originally designed with the idea of being only temporary to tide the system over such a period as might be required to determine the suitability from various points of view of the steam turbine for large power-plant work. Later, as the plans progressed, it was decided to make this plant of a substantial character, so that it might be permanent and be held as a reserve in case a large turbine plant was built which would supersede it for regular operation. Under these conditions four vertical, cross-compound Allis-Chalmers engines (28 in. and 60 in. x 48 in.) were installed, direct-connected to 1500-kw, 13,200-volt, 25-cycle General Electric generators. Each engine received steam from two Edge Moor boilers, having a combined heating surface of 13,000 sq. ft.

The plant was built on the unit plan so far as possible, each pair of boilers having a separate self-supporting steel stack, and each alternator a separate turbo-driven exciter. So far as the piping is concerned (although headers are arranged for interconnection), any unit may be operated independently of the other units.

In the early part of 1904 the requirements of the system had become such that additional power was necessary, the increased demand being chiefly for 600-volt direct current for the operation of cars in the congested section of the city. Although the dependability of the steam turbine had by this time been pretty well established, this was only in connection with alternating-current generators. As the Commerce Street station was a favorable point from which to distribute direct current it was decided on this account to add four additional engine units (32 in. and 68 in. x 60 in.) of the same type as before, driving 2000-kw, 600-volt direct-current generators. Simultaneously with this extension there was an increased requirement for 60-cycle alternating current for lighting and power purposes.

As space was available under the switchboard gallery, two 1000-kw vertical Curtis turbines driving 60-cycle, 2300-volt General Electric generators were installed. In connection with this installation there were added eight additional Edge Moor boilers each with approximately 7000 sq. ft. of heating surface. The same unit plan of arrangement was carried out in this extension as in the first. Although the units in each half are interchangeable so far as piping is concerned, there is no steam connection between the two sections, so that the bursting of a pipe or any similar accident cannot affect more than half of the plant. The coal-handling apparatus of this plant consists of hand-trolleys and special dumping wagons and Jones underfeed stokers.



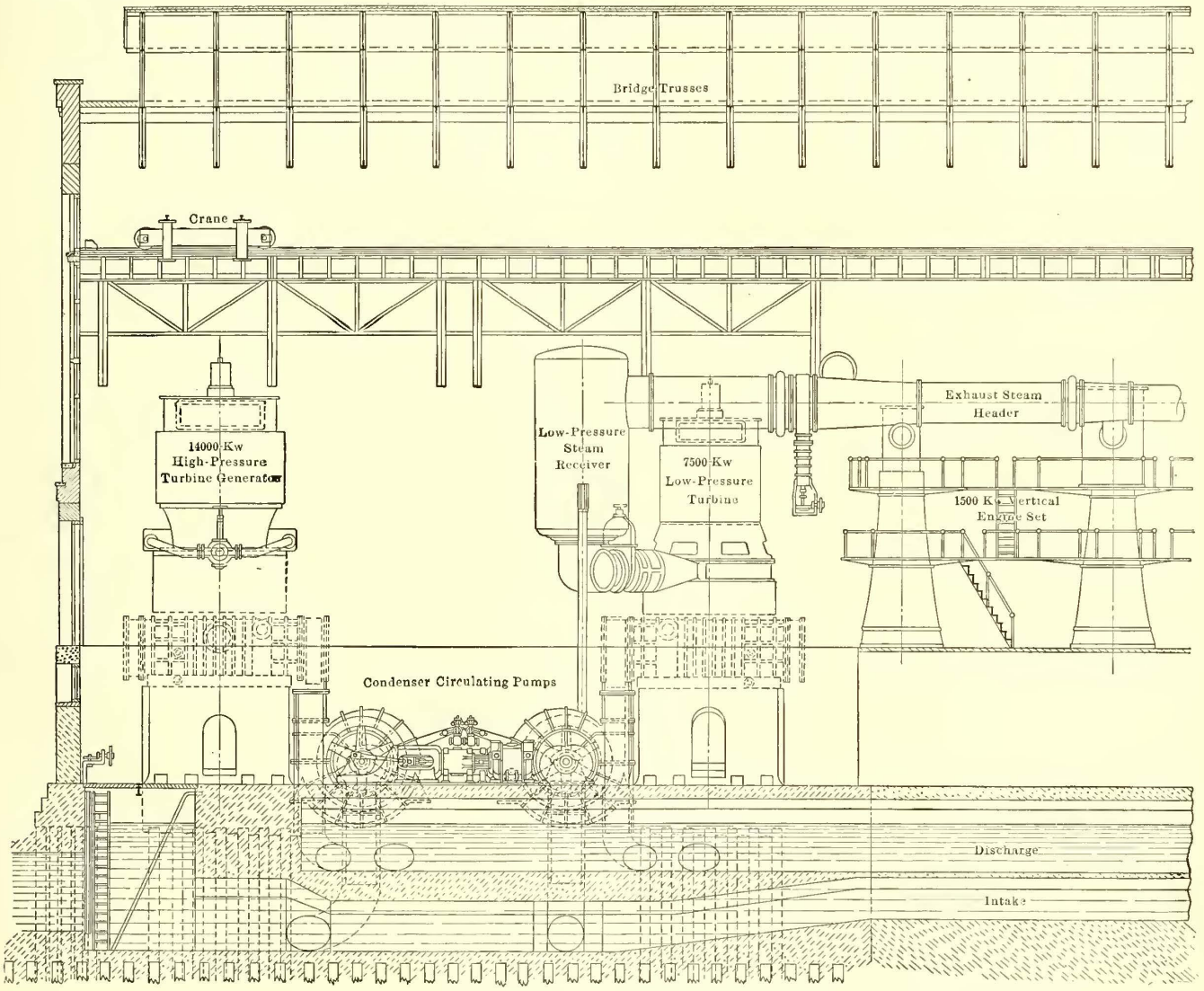
Milwaukee Power Station—Plan Showing Location of New High-Pressure and Low-Pressure Vertical Turbines in Relation to Location of Old Vertical Engine-Driven Sets

PRESENT TURBINE ADDITION TO STATION

Early in 1910 it was determined that further extensions and additions must be made, as the existing equipment was severely overloaded. Accordingly, an 80-ft. tract of ground north of the plant was acquired. Contracts have been placed for the building and machinery, and a large part of the building work has now been completed. The machinery to be installed in this extension consists of two 7500-kw, low-pres-

sure, 25-cycle vertical Curtis turbines and two 14,000-kw, high-pressure, 60-cycle vertical Curtis turbines. The condensing apparatus for these four turbines is exactly alike both for the 7500-kw, low-pressure machines and the 14,000-kw, high-pressure machines, the actual amount of steam to be handled in each case being approximately the same.

These condensers will be of the Worthington base type, located wholly under the turbines, and each will have 25,000 sq. ft. of cooling surface in 1-in. tubing. The circulating pumps, having a capacity of 30,000 gal. per minute, will be of the 36-in. centrifugal type, each driven by a 22-in. x 24-in. Laidlaw-Dunn-Gordon Corliss engine. These engines will also drive the dry vacuum pumps, 31-in. x 24-in., direct-connected behind the steam cylinders. The wet vacuum pumps are 5-in., two-stage



Milwaukee Power Station—Longitudinal Section Through Station

centrifugal pumps, and will be arranged to be driven by both induction motors and small steam turbines. It is the intention normally to adjust the turbine speed of these units so that the induction motor will be as nearly as possible in synchronism with the main generators, allowing the motor to float on the line. Should the turbine for any reason fail, the motor would then continue to operate the pump, or if, through any failure of the turbine governor, the speed should materially exceed normal, the motor would act as an asynchronous generator and tend to prevent disastrous over-speeding. Independent turbine-driven exciters will be provided, each directly connected to its respective generator.

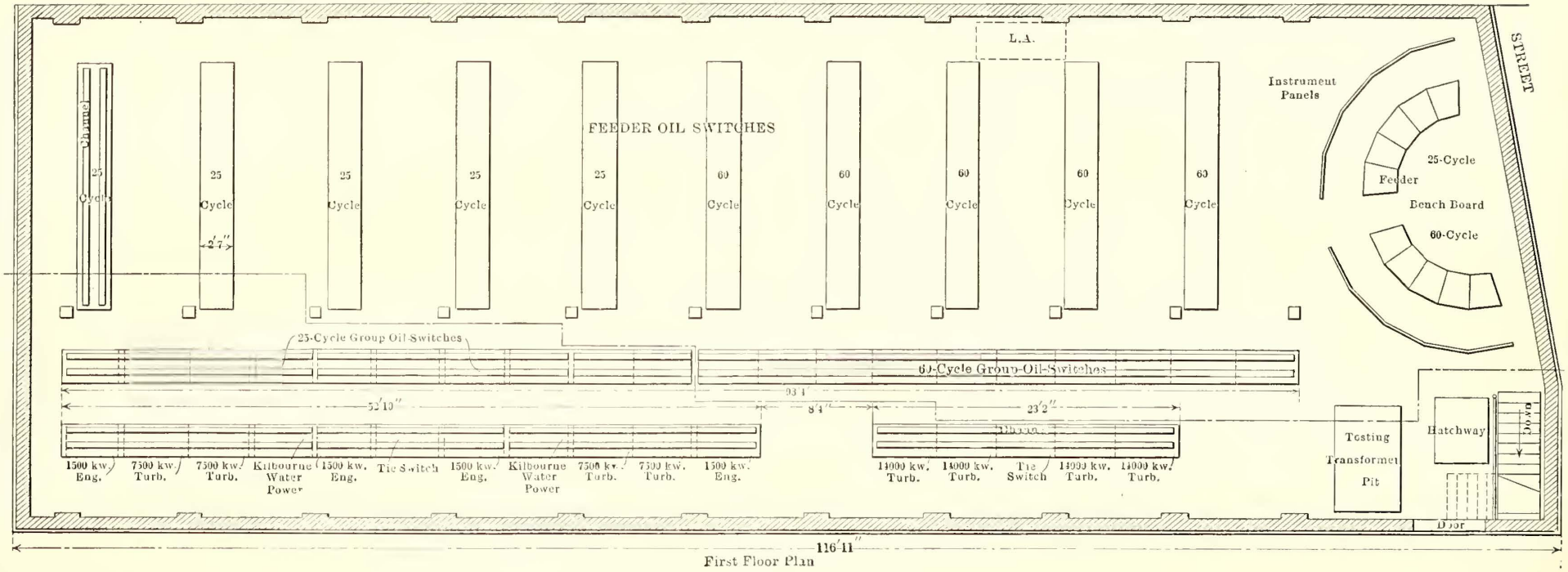
BOILERS AND PIPING

The boiler installation for this extension will consist of eight additional boilers, similar to the original installation, and each having 7500 sq. ft. of heating surface. For boiler feeding an arrangement of pumps with opposed cylinders is planned, using pot-form pumps with compound Corliss engines in connection with Hoppes heaters.

It will be noted that, considered on a conventional basis, the total capacity in kilowatts in this plant is very much in excess of the boiler capacity. Having determined that under peak conditions a boiler horse-power can be produced without difficulty on about 5 sq. ft. of heating surface without materially affecting the efficiency of the boilers, the company's engineers have concluded that it is better to do this during the peak, operating all the boilers, excepting those withheld for cleaning or repairs, during the lighter load periods of the day, than to have a much larger boiler installation, as is commonly done, operating at a ratio of 10 sq. ft. during the peak and having a large number of boilers banked all the rest of the day.

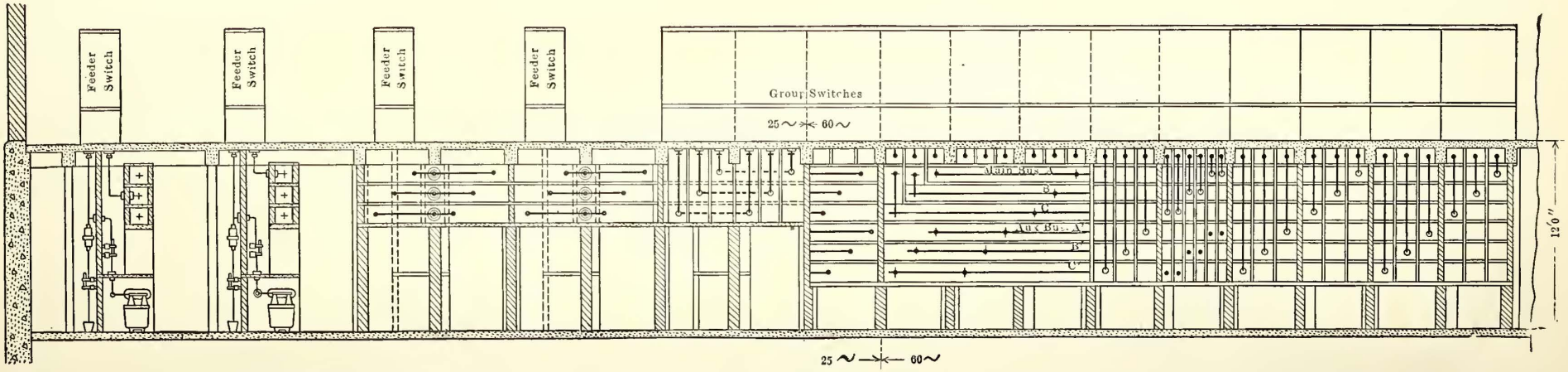
Each boiler is equipped with a superheater built on the top of the boiler and in reality an integral part of the boiler. This superheater has 25 per cent of the total boiler heating surface, and is used as an economizer through which the gases pass after leaving the water heating surface of the boiler. At normal rates of operation approximately 60 deg. of superheat is obtained from this source. In addition to this the eight new boilers which are to be installed and from which the high-pressure turbines will be supplied will be equipped with Foster superheaters which will deliver the steam to the turbines at 150 deg. above the temperature of saturation..

It has been found by test that the various engines, non-condensing, will have their maximum efficiency with a total ca-



First Floor Plan

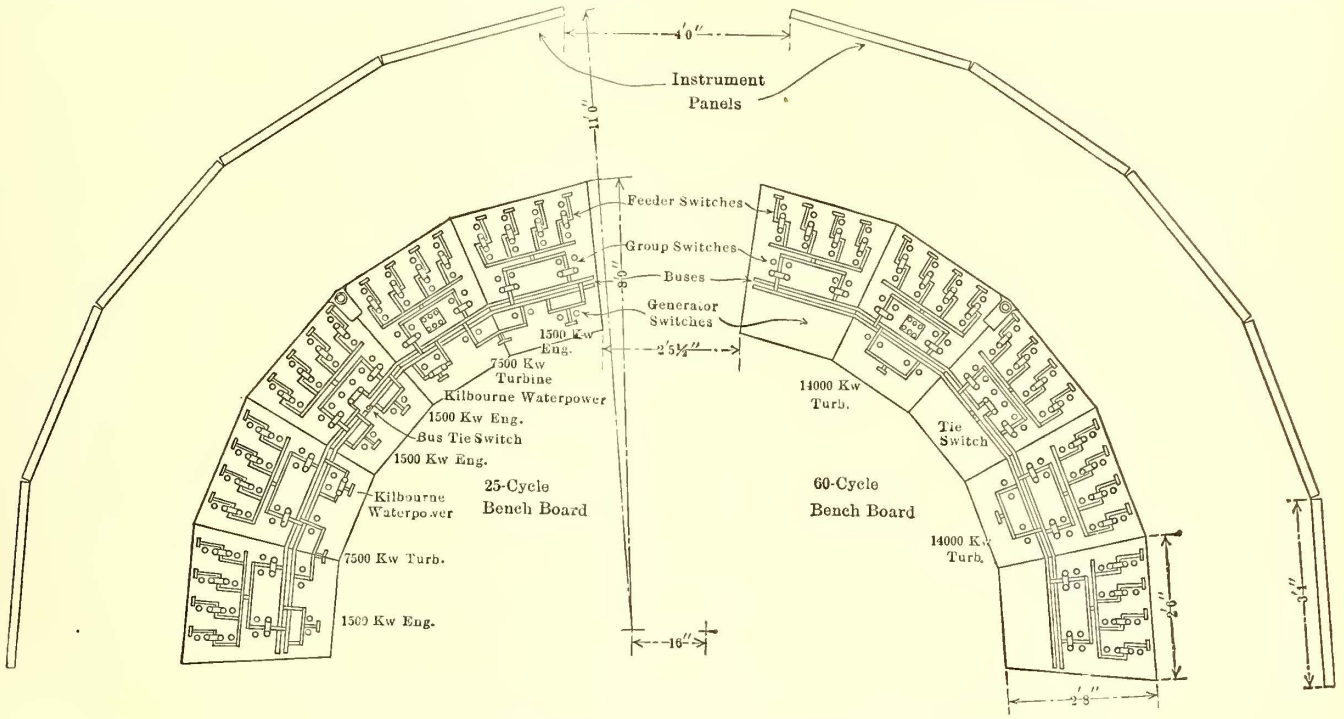
Milwaukee Power Station—Plan Showing Arrangement of Oil Switches in the New Switch House



Milwaukee Power Station—Partial Elevation and Sections Through Switch House, Showing Bus Structure in Basement

pacity of about 4000 kw in excess of the rating of the generator, and as the generators will readily operate without excessive heating with this additional load the total station capacity is considered to be 63,000 kw. The real estate occupied by this installation is 143 ft. x 240 ft. So far as the power plant proper is concerned, there is therefore 1 kw installed for each 0.545 sq. ft. of ground area.

A feature of this installation which, in its construction, has involved much study is the low-pressure piping between the engines and the turbines into which they exhaust. To make this piping as short as possible and to avoid unnecessary bends it was decided to carry it overhead, and the last end of this pipe, next to the separator, was made 66 in. in diameter in order to reduce the velocity of the steam sufficiently to permit proper action on the part of the Hoppes separator. This separator is 10 ft. in diameter and approximately 22 ft. long. As the pipe referred to has a fairly rigid connection to each engine, the expansion must be necessarily taken up at intervals between the engines. However, as it was not considered safe to trust to the rigid connections as anchorages, it became necessary to design a harness which would anchor the pipe to itself.



Milwaukee Power Station—Feeder Control Benchboard in the New Switch House

GENERATING EQUIPMENT

As has been already mentioned, the new generating equipment of the enlarged station will comprise two 14,000-kw, 60-cycle turbine generators and two 7500-kw, 25-cycle, low-pressure turbine machines. This apparatus will be in addition to the existing equipment of four engine-driven, 1500-kw, 25-cycle, 13,200-volt alternators, four engine-driven, 2000-kw, 600-volt direct-current generators and two 1000-kw, 4000-volt, 60-cycle turbine generators whose output is used directly for lighting purposes.

The 60-cycle, 13,200-volt feeders will thus be supplied from two 14,000-kw turbine alternators, while the 25-cycle generating equipment of the station will comprise the four existing 1500-kw, engine-driven, 13,200-volt, 25-cycle alternators, together with the two newly installed low-pressure turbines driving 7500-kw, 25-cycle alternators and utilizing the exhaust steam from the eight engines.

GENERATOR COMPENSATORS

The generator pressure of both the new 14,000-kw and 7500-kw turbine generators is 6600 volts, or one-half the bus potential of 13,200 volts. The energy from the generators will be fed through compensators of the auto-transformer type, having a ratio of 1 to 2 between taps. These compensators will be installed under the operating switchboard gallery in the generator room and directly opposite the machines they serve. The 7500-kw, 25-cycle generators will be equipped with banks of three 1250-kw compensators, the total three-phase rating of these groups aggregating 3750 kw, or one-half of the generator rating, since only half of the generator output is actually transformed in the compensators. The 14,000-kw, 60-cycle generators will be similarly served by banks of three 2333-kw compensators, aggregating 7000 kw in three-phase rating. The use of these compensators with half-potential generators marks the newest practice in the installation of large turbo-generator units, and is designed to suppress surges and to protect the armature coils of the generators against severe shocks or short-circuits.

The incoming 25-cycle transmission lines from the 8000-hp Kilbourn water-power plant on the Wisconsin River, 120 miles distant, pass through the Commerce Street station from the West Allis substation, and are handled as local station generating capacity in making up the busbar connections at the operating switchboard, being furnished with oil-switch remote control similar to the other generator units. In the case of these transmission line switches this control is duplicated at the feeder switchboard in the switch house.

The generator switchboard will be equipped with operating signals of the ship type, duplicate dials with pointers indicating positions labeled "Stop," "Start," "Field Off," etc., being installed on the gallery and at the side of the turbine units themselves, so that close communication can be maintained with the generator floor. The geenrators will also be equipped with totalizing watt-hour meters, while indicating wattmeters showing the load on each machine are to be installed near the steam gages for the engineer's reference.

SWITCH HOUSE

The electrical switching of the enlarged and reconstructed Commerce Street station will be divided between the overhead "operating" switchboard in the generator room itself and the dispatching or feeder benchboard in a new switch house erected just across Poplar Street from the power house. All operations pertaining to the actual manipulation of the machines themselves, including the connection of incoming generators to the busbars, will be controlled from the generator switchboard; while the switching of the 10 group and 40 feeder circuits will be handled from the feeder benchboard at one

end of the special structure in which the group and feeder oil-switches are to be housed.

The switch house is a 117-ft. x 40-ft. brick structure, of one story and basement, and is about 60 ft. distant from the main power house. The engraving on page 294 shows the arrangement of the generator, group and feeder oil switches and the control switchboard, on the main switch floor level, while the basement contains the busbar compartments, lightning arresters, instrument transformers, etc.

The control benchboard in the switch house, locally designated as the "feeder benchboard," will comprise two five-panel sections, arranged in the arc of a circle. The left-hand section will control the 20 25-cycle feeders and the right-hand section the same number of 60-cycle feeder switches. On the vertical boards behind the benches will be mounted the instruments, etc. The arrangement of the switch contacts on the panels of the benchboard follows that of the oil switches themselves in the switch house.

The duplicate 60-cycle and 25-cycle generator buses are sectionalized at points of symmetry of connected apparatus, the main buses being broken by remote-controlled tie switches, while the auxiliary buses are equipped with simple disconnecting blades only. The tie switches will be operable from both the feeder benchboard and the operating switchboard in the power house, indicating lamps at both points showing the position of the switches. Each half of the 25-cycle buses will be arranged to be connected to two 1500-kw engine-driven alternators, two 7500-kw turbine-generators and one Kilbourn line, the corresponding switches being grouped symmetrically about the sectionalizing switches. These generator switches will be controlled entirely from the generator switchboard in the power house, indicator lamps showing the position of the switches at the feeder board. The Kilbourn or West Allis substation lines, however, will also have control points located on the feeder benchboard, so that they can be handled from either board.

The group switches, each controlling four feeder circuits, will be ranged in a row parallel with the generator switches and, like the four feeder switches under each of them, will be all controlled from the feeder switchboard. The feeder switches will be installed in parallel rows at right angles to the generator and group switches and directly over the group buses, at the end of each of which aluminum-cell lightning arresters will be connected. Ample room has been left in the busbar compartments, so that instrument transformers can be connected on any feeder to register the energy taken by it. At the control benchboard name plates will be attached to the group-switch contacts, showing the destination of the feeders connected under each group. The oil switches in the switchhouse will be inclosed in clear wire-glass doors, so that an unobstructed view of the operating parts and through successive rows of switch inclosures will be possible.

OTHER PLANTS OF MILWAUKEE SYSTEM

The new reconstructed Commerce Street plant of the Milwaukee Electric Railway & Light Company will serve the combined electric railway and central station load of the city in conjunction with the other steam plants of the company at Oneida Street and in the Public Service Building. The Oneida station contains two 1050-kw, 600-volt engine-driven direct-current generators; one 1050-kw, 250-volt generator, and four 400-kw, 125-volt generators, besides two 1500-kw, 25-cycle, 250-volt motor generator sets, one 500-kw balancer set and a 1500-amp-hour, 250-volt storage battery. In the Public Service Building, which contains the company's offices, are three 1500-kw, 2300-4000-volt, 60-cycle, non-condensing, high-pressure steam turbines, exhausting into the steam heating system, from which the central section of the city is supplied with heat, and two 1500-kw motor generator sets similar to those in the Oneida station. The Milwaukee system also receives about 8000 kw from the Kilbourn water power plant. The company has also recently completed the construction of its Clinton Street substation on the south side of Milwaukee, which will contain four 2000-kw, 25-cycle, 600-volt rotary converters, three of which are being installed at once. This station has also been designed as a switching point for lighting service.

John I. Beggs is president and general manager of the Milwaukee Electric Railway & Light Company. C. J. Davidson is chief engineer of power plants, and O. M. Rau is electrical engineer.

SPECIAL TRACK CONSTRUCTION IN MOBILE, ALA.

In carrying out some track work during the year 1908 the Mobile Light & Railroad Company devised a special construction for Dauphin Street, which has a clay subsoil. This street contains a great many water, sewer and gas pipes, a very large storm sewer and telephone conduits, all of which had to be lowered on account of the new grade, so that the street was badly cut up with deep ditches which ran both parallel to and across the tracks of the street railway. The city does not take proper care of the back-filling, which naturally causes the earth to settle and so entails considerable trouble and expense in the maintenance of the track structure. It was, therefore, decided to put in an extraordinarily good track, the concrete work of which would form an arch capable of holding up the track even though the filling in the ditches underneath should settle.

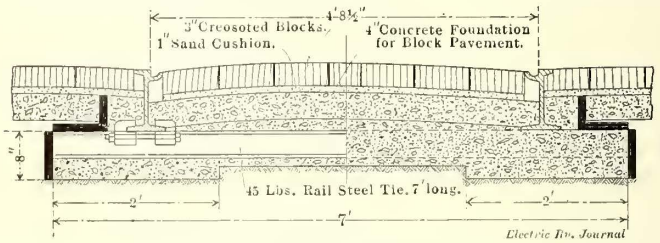


Fig. 1—Cross-Section of Mobile Track, Showing Old Rails Used for Ties

The engraving (Fig. 1) shows a cross-section of this work.

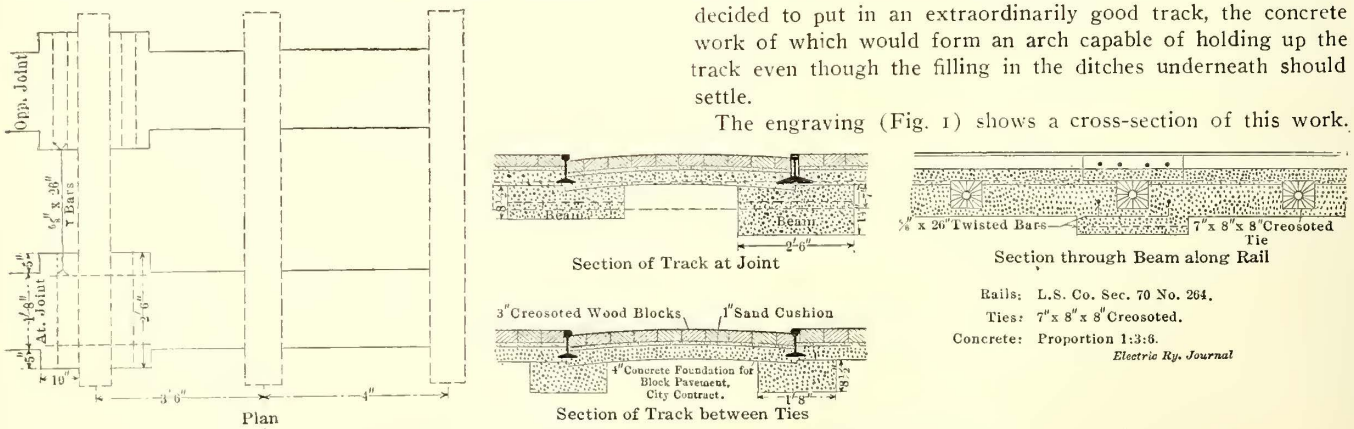


Fig. 2—Standard Concrete Beam Construction in Mobile, Ala.

Rails of Lorain section No. 89-319 are laid on ties which consist of old 45-lb. T-rails, spaced 5 ft. centers, with tie rods 7 ft. centers. In order to secure a suitable fastening between the ties and the rails, there was developed the two-piece base and tie clamp shown in the illustration. The two halves of the clamp are connected by two ⅞-in. bolts, the whole constituting a very firm attachment.

The construction, as shown in the engraving (Fig. 2), is that used on streets with sand foundation, and consists of longitudinal reinforced concrete beams varying in depth and width according to whether the construction is under continuous rail, under a joint or opposite a joint as shown in the drawings. The 7-in. x 8-in. x 8-ft. creosoted ties are laid at intervals of 4 ft. The paving construction required by the city is light, and consists of 4-in. concrete, a 1-in. sand cushion and 3-in. creosoted wood blocks. Although Fig. 2 shows a 7-in. rail, the company has adopted the 9-in. Lorain section No. 89-319 as a standard on paved streets, preferring to have the base of the rail more thoroughly embedded in concrete than is possible with a 7-in. section.

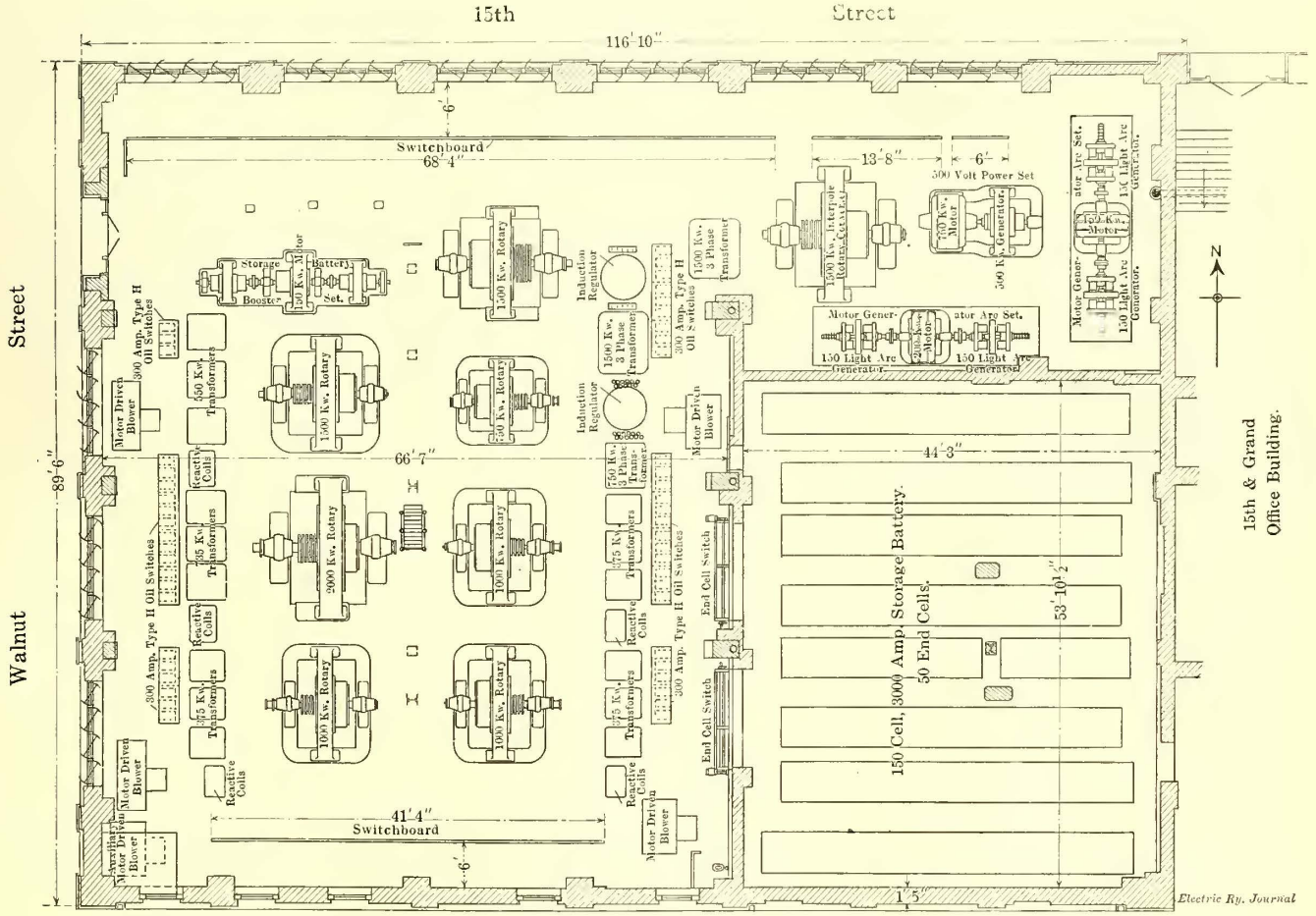
NEW OFFICE AND SUBSTATION BUILDING OF KANSAS CITY COMPANY

The Metropolitan Street Railway and the Kansas City Electric Light companies are just rearranging their offices in their greatly enlarged building. A view of this building taken while decorated for a carnival is reproduced on page 298. The front portion of the building is the older part. Some time ago this section was found inadequate for accommodating the entire executive and office forces of all departments so that it became necessary to quarter the claim department in another building. The new section shown in the rear of the view has just been completed and was so designed in connection with the older part, which has been rearranged, that modern quarters would be furnished to all departments. The new addition to the office building was erected over a large railway and lighting substation, the operation of which was not interrupted during construction work. This substation is described further on.

The older portion of the office building is four stories in height, and the new portion has four office floors and a substation floor equal in height to two office floors. The first office floor of the new section will be occupied by the testing department and by the lighting department; the second office floor will be occupied by the operating division of the lighting department; the third floor by the operating and executive departments of the railway, and the top floor by the claim and legal departments.

The new section of the building is slightly larger than the old. It has a floor space 112 ft. x 86 ft. and each floor is subdivided according to the needs of the department which will occupy it. A vault has been built to the full height of the building and is accessible from each floor. The new structure is made of brick and was built by day labor under the supervision of the engineering department of the railway and light company.

Each floor is so subdivided that a row of offices will extend around the outer walls and a large open space be provided in the center of the floor for the clerical assistants. This center space will be lighted by a light shaft extending from the first floor to the roof. The shaft is 36 ft. 10 in. long x 10 ft. 8 in. wide and is glazed for the full height of each floor with wire glass set in steel frames. The bottom of the air and light shaft inclosure is at an elevation just above the substation ceiling, or approximately that of the first office floor. This floor is directly above the roof of the former substation building now inclosed by the new addition to the offices. The roof remains



First Floor Plan of Walnut Street Substation, Metropolitan Street Railway, Kansas City, Mo.

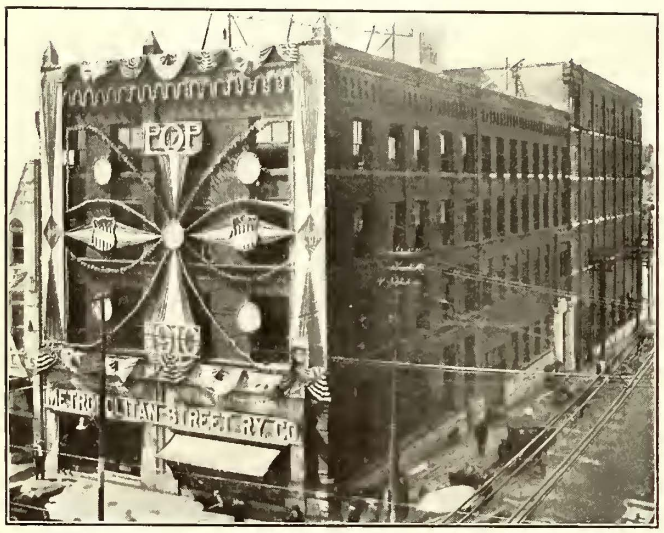
as it formerly was, except for the opening cut through into the bottom of the airshaft. This opening now is protected by steel doors so arranged that in event of fire they may be dropped and any water coming down through the airshaft will drain onto the old substation roof, which is of fireproof construction. Thus the substation is entirely separated from the office building by a fireproof structure inclosed within the office structure.

SUBSTATION ENLARGEMENT

The accompanying floor plan shows the arrangement of the railway and lighting substation apparatus as now installed in

the enlarged substation contained within the new section of the office building. The railway apparatus includes three 1000-kw, one 2000-kw and one 1500-kw rotary converter. The lighting circuits are supplied from two 1500-kw rotary converters and one 750-kw motor-generator set. These units are supplemented by a battery of 150 cells of chloride accumulators of 3000 amp-hours capacity, which is used principally in connection with the Edison circuits. Two 150-light arc generators are driven by a 200-kw motor. A 500-kw, 500-volt motor-driven generator has been installed to feed into a downtown power circuit. The motor of this set is a 6600-volt induction machine which during the daytime takes current from the substation transmission bus fed from the company's main generating station.

In addition to its main generating station, the company operates a smaller station close to the center of the commercial district, in which steam is generated at 160 lb. pressure and reduced to 5 lb. for distribution in heating mains. The high-pressure steam is used also to generate current for power circuits and for an Edison circuit load. At night, when the load on the 500-volt power circuit falls off, the 500-kw motor generator set connected with it in the substation automatically takes power through the tie line to the steam-heating station and operates as a 6600-volt motor generator delivering current to the light-



Combined Office and Substation in Kansas City, Mo.

ing company's 6600-volt buses. By this arrangement the fullest advantage is realized from the steam at the heating plant.

With the addition of the new apparatus to the substation and the erection of office floors above the substation, the power department has rearranged the incoming and outgoing lines and placed them all underground.

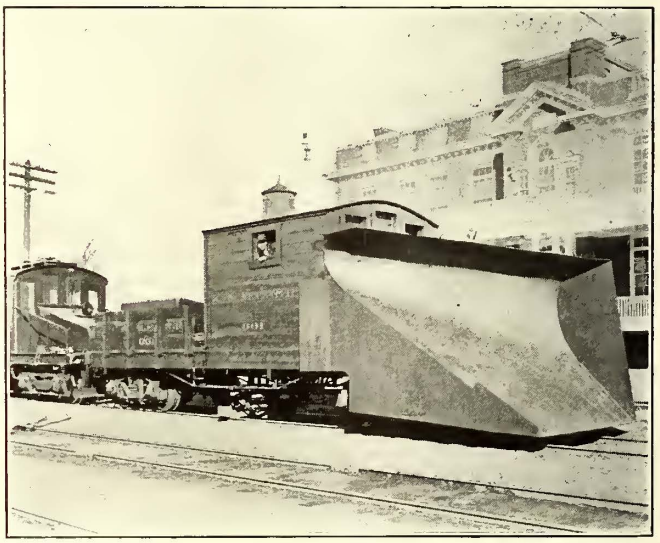
PERFORMANCE OF AUTOMATIC BLOCK SIGNALS IN HUDSON TUNNELS

A remarkable record of signal operations was made by the Hudson & Manhattan Railroad during the month of January, 1911. Out of a total of 8,916,157 movements of signals, automatic stops and interlocked switches there were only four failures, involving a total of seven minutes of train detention. The four failures occurred with the automatic signals, which made 5,515,441 movements. No failures were recorded against the automatic stops, which made 2,821,443 movements, or against the interlocked switches, which made 579,273 movements. The causes of the four signal failures were track fuse blown, dirt in magnet valve, track circuit broken and relay stuck. This fine record not only speaks well for the signal apparatus installed, but particularly for the care and thoroughness with which it is maintained by the railroad company's signal department.

NEW SNOW PLOW BUILT BY CHICAGO & MILWAUKEE ELECTRIC RAILROAD

The Chicago & Milwaukee Electric Railroad during the blizzard of Feb. 5 and 6 had an opportunity to demonstrate the serviceability of a large snow plow built during the past season at the company's shops in Highwood, Ill. This road operates high-speed trains, making the run of 74 miles between Evanston and Milwaukee in 2 hours and 15 minutes, and in addition has a service of local and suburban trains operating during a part of the day on 15-minute headway. E. E. Downs, general manager Chicago & Milwaukee Electric Railroad, states that the new plow, shown in the accompanying illustration, did very efficient work in removing drifts, some of which were higher than the plow itself. During the recent blizzard the road was enabled to keep its service operating with no trains more than 20 minutes off schedule at any time. Mr. Downs attributed this entirely to the use of the new plow and the Root track scrapers with which many of the interurban cars are equipped.

The new snow plow is mounted on a standard freight car carried on M. C. B. trucks. The length of the equipment over all is 38 ft. 9 in. and the width of the nose is 8 ft. 8 in. The



Snow Plow Built by Chicago & Milwaukee Electric Railroad

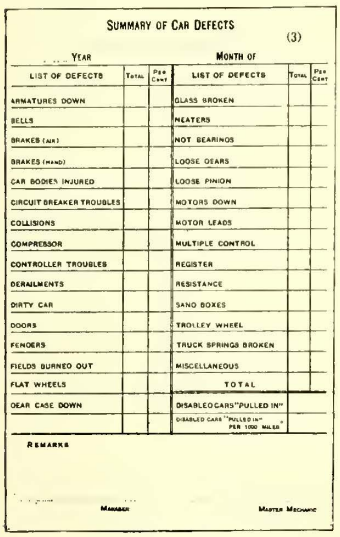
plow is made of sheet steel ⅜ in. and ⅛ in. thick and is carried on an extension of the car framing. The shape of the nose is arranged for double-track work so that the nose lifts and shears the snow to the right-hand side of the track. A set of heavy Root track scrapers is mounted under the middle of the car body which carries the plow, and these scrapers effectively clean the rails after the large mass of snow has been removed by the plow.

In fighting snow this plow is pushed by one or more of the company's sloping cab-type, 38-ton, all-steel electric locomotives. The plow is weighted with 18 tons of rail running the full length of the platform. Two supply boxes are carried on the rear of the platform, which has a heavy matched oak floor and is also surmounted by a cab 10 ft. x 10 ft. in size. In the two boxes at the rear of the car platform are supplies of salt and sand which are led to the rails by independent spouts from each box. This provides a good rail for the locomotive which pushes the snow plow. The substantial design of the new snow-fighting equipment is shown in the accompanying illustration. This equipment represents the combined ideas of the heads of the operating department of the road.

Trial runs have been begun on the electrified Dessau-Bitterfeld line in Germany. Speeds as high as 62 m.p.h. have been attained with 350-ton trains.

IMPROVEMENTS IN SAVANNAH, GA.

The Savannah (Ga.) Electric Company, which is under the general management of the Stone & Webster Management Association, Boston, and the local management of M. L. Sperry, has been making a number of important improvements during the past year in the track and power departments. A large part of the reconstruction of track is due to the increase in paved streets in Savannah. At this time the company operates about 57 miles of track, which include 21 miles of suburban lines, the general construction of which will remain as at the present time. By the end of 1910 about 25 miles of the 36 miles of city track had been relaid in paved streets. The old tracks were T-rails weighing from 40 lb. to 50 lb. a yard. These have been replaced by a 7-in. 70-lb. T-rail which is laid with Continuous rail joints and No. 0000 compressed bonds on 7-in. x 9-in. x 8-ft. black-cypress ties. These black-cypress ties are excellent for the sandy soil of Savannah. They are laid directly on the ground. The asphalt or brick paving is laid after the substructure has been flooded and hardened by a 7-ton roller. Concrete is used only under special work, but in some cases cinders have been used for the same purpose where concrete could not be placed on account of the impracticability of diverting the cars during reconstruction. Although some of the streets are paved with block, there is considerable asphalt paving. As a rule granite headers are used in the asphalt paving.



SUMMARY OF CAR DEFECTS (3)

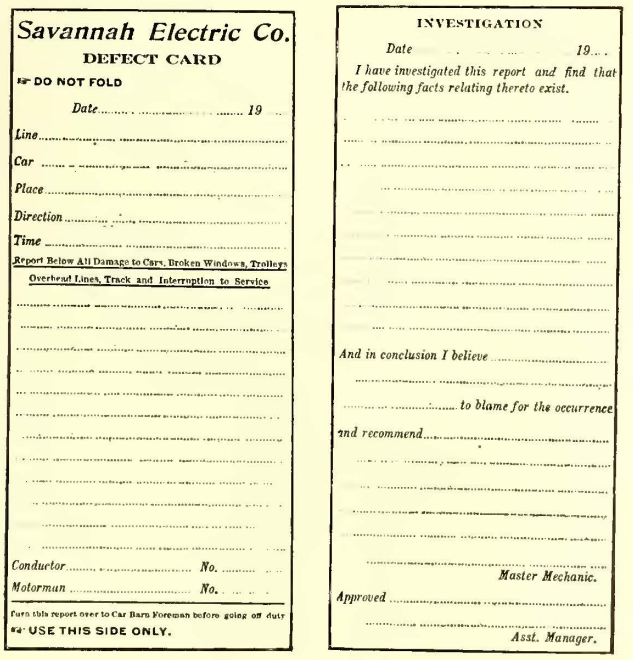
YEAR ____ MONTH OF ____

LIST OF DEFECTS	TOTAL	PER CENT	LIST OF DEFECTS	TOTAL	PER CENT
ARMATURES DOWN			GLASS BROKEN		
BELLS			HEATERS		
BRAKES (air)			HOT BEARINGS		
BRAKES (hand)			LOOSE GEARS		
CAR BODIES INJURED			LOOSE PINION		
CIRCUIT BREAKER TROUBLES			MOTORS DOWN		
COLLISIONS			MOTOR LEADS		
COMPRESSOR			MULTIPLE CONTROL		
CONTROLLER TROUBLES			REGISTER		
DERAILMENTS			RESISTANCE		
DIRTY CAR			SAND BOXES		
DOORS			TROLLEY WHEEL		
FENDERS			TRUCK SPRINGS BROKEN		
FIELDS BURNED OUT			MISCELLANEOUS		
FLAT WHEELS			TOTAL		
GEAR CASE DOWN			DISABLED CARS "PULLED IN"		
			DISABLED CARS "PULLED IN" PER 1000 MILES		

REMARKS

MANAGER MASTER MECHANIC

Monthly Summary of Car Defects



Savannah Electric Co.

DEFECT CARD

DO NOT FOLD

Date ..... 19 ...

Line .....

Car .....

Place .....

Direction .....

Time .....

Report Below All Damage to Cars, Broken Windows, Trolleys Overhead Lines, Track and Interruption to Service

Conductor ..... No. .....

Motorman ..... No. .....

Turn this report over to Car Barn Foreman before going off duty

USE THIS SIDE ONLY.

INVESTIGATION

Date ..... 19...

I have investigated this report and find that the following facts relating thereto exist.

And in conclusion I believe .....

..... to blame for the occurrence

and recommend .....

Master Mechanic.

Approved .....

Asst. Manager.

Front and Back of Defect Card

50-kw Westinghouse exciter, direct-connected to a Terry steam turbine. The principal railway unit is a 800-kw generator connected to a Cooper-Corliss engine. When the load drops off this machine is shut down and the load is carried by one or two 300-kw, 500-volt generators. The 1000-kw turbine previously referred to was bought under the following steam consumption guarantee, assuming 180 lb. steam pressure and 28 in. vacuum at the turbine exhaust nozzle: Full load, 18 lb.; 25 per cent overload, 17.80 lb.; 50 per cent overload, 18 lb. The total capacity of the Savannah plant now comprises 2207 hp in boilers, 2920 hp in engines and 2250 hp in turbines. The turbines handle all a.c. lighting and power circuits. The d.c. lighting is cared for by one 300-kw 3-wire generator and four 3-wire generators which are direct-connected, two per engine, to a pair of Harrisburg engines. The total capacity of the four generators is 400 kw.

Shop maintenance records in Savannah are kept on standard forms, devised by the Stone & Webster Management Association, of Boston. Among these forms are car inspection charts, which indicate when motors, controllers, compressors, bearings, gears, trolley bases and other parts should be inspected; defect cards which are turned in by the car crews, and a summary of car defects, including pull-ins, made up monthly by the master mechanic. All of these forms are shown in the accompanying cuts.

	Daily.	Twice a Week.	Weekly.	Monthly.	Yearly.	Special.
LUBRICATION						
Motor axle bearings—old types	150					
" " " —new types		500				
Armature bearings—old types	150					
" " old style, new types		500				
" " new types			1000			
INSPECTIONS						
Inspect on of brakes & shoe renewals.. Sweeping and dusting.... Tightening loose bolts and nuts.... Bells, signs, glass, etc....	150					
MOTORS						
Brushes and holders	150					
Blow out motor cases with air			1000			
Clearance—old types		500				
" —new types			1000			
Motor end play				5000		
COMPLETE OVERHAULING					50000	
CONTROLLERS, TYPE K						
Regular inspection—cleaning & adjust..		500				
Blow out with air			1000			
THOROUGH OVERHAULING					50000	
COMPRESSOR						
Regular inspection and oiling.... Test for air leakage.... Brush holder and end of commutator wiped off....			1000			
Thorough overhauling					50000	
JOURNAL BEARINGS						
Inspected, oiled and packed				5000		
See if bearing is clear at edges. Covers on journal boxes	150					
GEARS AND PINIONS						
Inspected and lubricated						1500
TROLLEY WHEELS						
Inspected and oiled, contact spring adjusted	150					
TROLLEY POLE AND BASE						
Tension on spring—pressure on wire 25 lb	150					
LIGHTNING ARRESTERS						
Clean and adjust after each storm				5000		
CIRCUIT BREAKERS						
Clean and adjust				5000		
CAR WASHING			1000			
RESISTANCES						
Clean, if exposed			1000			
PAINT						
Touching up and varnishing					50000	
BRAKE CYLINDERS						
Piston travel (not over 5 in.)				5000		
COMPLETE GENERAL INSPECTION.				5000		

NOTE:—Figures indicate inspection periods on a mileage basis, which basis is recommended particularly for general inspection and overhauling.

Car Inspection Mileage Chart

All motors, even the GE-800's, are lubricated with oily waste, at a cost of about 14 cents per 1000 car-miles. The oil is bought direct from the Standard Oil Company. Gears and

pinions are lubricated with West Virginia black oil, purchased from the same company. The substitution of oil for grease in motor lubrication cut the cost of babbitt in half. The standard babbitt metal for armature bearings is Adamant, furnished by the Magnolia Metal Company. This has a life of about 35,000 miles. The standard carbon brush in Savannah is the National Carbon Company's Partridge type. This brush is giving an average life of about 6073 miles and is applied at a tension of 6 lb. per square inch. The standard brake shoe is the American Brake Shoe & Foundry Company's design M-512. This shoe is applicable to all the heads used in Savannah on Peckham, Brill and Du Pont trucks. The average life of the shoe is 3015 miles. New shoes weigh 35 lb. and discarded shoes about 10 lb.

REPORT OF THE NEW YORK PUBLIC SERVICE COMMISSION, SECOND DISTRICT

The fourth annual report of the New York Public Service Commission, Second District, for the year ended Dec. 31, 1910, shows that at the close of the year there were 944 corporations, municipalities and individuals engaged in serving the public in some capacity, or incorporated for the purpose of rendering such service, that by operation of law placed them under the supervision of this commission. The street railroad corporations were as follows: Operating, 79; inchoate or dormant, 33; lessor, 17; total, 129.

The amounts actually expended by this commission since its organization, July 1, 1907, to the close of the State fiscal year, Sept. 30, 1910, are as follows: July 1, 1907, to Sept. 30, 1908, $307,734; Oct. 1, 1908, to Sept. 30, 1909, $276,575; Oct. 1, 1909, to Sept. 30, 1910 $295,443. The foregoing do not include the State's expense in grade crossing eliminations ordered by the commission. For the fiscal year commencing Oct. 1, 1910, there was appropriated for the general expenses of the commission $372,830. The estimate which was submitted by the commission for its expenses for the fiscal year commencing Oct. 1, 1911, was $393,537.

ANNUAL REPORTS

Regarding the work of the division of statistics and accounts the report says in part:

"The division has undertaken to examine carefully each report filed with the commission. Where discrepancies or inaccuracies are discovered the corporation is asked to correct them. After two years' experience it may be said that the efforts of the division are met by most of the corporations with which it has to deal in a spirit of courtesy and co-operation. The reports filed by a few indicate, however, that there is either an intent to evade the accounting rules or that there is a lack of knowledge as to their requirements. With the limited force at its command the division has not been able to extend to the small corporations the assistance in arriving at a correct understanding that it would like to extend, but improvement in this direction is hoped for as a future possibility.

"The division has been somewhat hampered in its work through its inability to retain for any considerable period of time the services of many of the employees who have been engaged for its work.

"During the earlier days of the commission, and until the corporations had been given sufficient time in which to familiarize themselves with the more extended form of reports prescribed by the commission, it has been deemed unwise to attempt to enforce compliance with the law by bringing suits for penalties. It is now believed that the time for such leniency has passed. The forms of annual reports have become substantially settled, corporations have had sufficient time in which to install the uniform system of accounts prescribed, have learned how to make the reports properly, and there is no longer any reason why they should not obey literally, except in isolated cases, the requirements of the law with reference to the time of filing the report. The work of the commission is hindered and embarrassed by the delay, which it is believed arises in most cases from mere inattention and neglect. The policy of the commission hereafter will be to exact the penalty prescribed by law in cases of disobedience."

TARIFFS

On Nov. 30, 1910, there were in force for electric street and interurban railways 218 freight tariffs and 166 passenger tariffs. In the year ended on that date the electric railroads showed an increase of 36 freight and 8 passenger tariffs.

Of the orders granted which involved reduction in rates 16 related to freight traffic of electric street and interurban railroads and 22 to passenger traffic of such roads.

On the subject of tariffs of street and interurban railroads the report says: "No material changes were made in fares applying to local one-way travel. It is noticeable, however, that interurban lines are more generally establishing fares applying to round-trip, 60-trip and school commutation travel. Many companies have provided such fares for such classes of travel during the year. Fares applying to the sale of interline tickets for through travel have also been provided by several of the larger interurban lines. Several of these companies have made extensions to their lines, and in all cases fares to cover travel to and from points reached by such extensions have been established.

"The managements of electric street and interurban properties have given much time and consideration to the subject of uniformity in certain of their rules and regulations relating to passenger travel, with a view of making them conform more closely, in order that they may thereby serve the public with greater convenience. A committee appointed by the Street Railway Association of the State of New York has the subject under consideration and has held several meetings, at all of which meetings the chief of the division of tariffs of the commission was present. This committee recently submitted a progress report to the association, which was approved, and the committee was instructed to continue its work, all of which tends toward the ultimate establishment of joint tariffs to cover through travel over such lines."

Regarding the freight traffic of street and interurban railroads the report says that generally the companies that engage in the transportation of property conduct the business upon a plan which is a combination of methods used by both express and steam railroad companies. During the year 89 schedules relating to transportation of property were filed. The percentage which the number of reduction changes bears to the total number of changes made was found to be approximately 71 per cent.

STREET RAILROAD INSPECTION

A section relating to street railroad inspection gives a list of roads inspected during the year. On Aug. 29, 1910, an assistant inspector of street railroads was appointed. This addition will permit attention to a number of important matters affecting service furnished by street railroad companies. During the calendar year 32 accidents and 31 complaints were investigated. The report adds:

"On the roads inspected during the year and by observation of physical conditions on others, it was found that the track, roadbed and structures of the electric roads in this Public Service district are generally maintained in a proper condition for safe operation. All the companies operating the interurban roads have been liberal in their maintenance expenditures during the past year; a large number of tie renewals have been made; a large amount of ballast has been put in; cuts have been sloped and ditched; shoulders have been widened on fills; in a number of cases right of way has been cleared of trees and brush which obstructed vision; and in nearly all cases a sufficient track force is maintained.

"A large proportion of the above improvements have been made in compliance with recommendations of this commission based on previous inspections.

"That the high-speed interurban roads are maintained in good operating condition is shown by the fact that during the past year very few, if any, accidents have occurred on them which were directly attributable to defective track or roadbed.

"There were no failures of structures of any kind on any of the roads, city or interurban, during the year.

"Generally, cars are maintained in good condition. During the past two years there has been a decided improvement in the maintenance of cars, especially in appearance and cleanliness. That this is in a measure due to inspection and investigation of complaints there can be no doubt.

"Several of the companies have increased their repair shop facilities.

"The use of air brakes on city cars is being extended.

"A number of additional pay-as-you-enter cars have been put in service during the year. These cars generally seem to receive public approval.

"During the year there were 1306 accidents on street surface railroads, including city and interurban roads: 1070 were of a minor character, such as persons falling from cars, vehicles being struck by cars, etc., on city lines; 29 were head-on collisions; 104 were rear-end collisions; 90 were derailments; 13 occurred at grade crossings of steam railroads. Of the above accidents, the following occurred on interurban roads: 3 head-on collisions; 9 rear-end collisions; 21 derailments; 1 at grade crossing of steam railroad. None of the derailments on interurban roads was caused by defective track or broken rails: 13 of the derailments on these roads were caused by running through switches, nearly all at meeting points where cars were running at slow speed; 8 were the result of brake beams and other parts of the equipment dropping, and other causes.

"There were 122 persons killed and 1521 injured during the year as the result of the operation of electric cars on city and interurban roads. Of these, 13 passengers were killed and 726 injured, 11 employees killed and 97 injured, 98 trespassers killed and 698 injured.

"During the year there were no passengers or employees killed on interurban cars, and 97 were injured. Of these, 10 were injured in head-on collisions, 50 in rear-end collisions, 35 in derailments, and 2 were injured at grade crossings of steam railroads.

"The above statements of accidents are based on the reports received from operating companies. These include persons who received slight injury, such as being cut by broken glass, bruises, sprains, and shock, which in a measure accounts for the large number of passengers injured.

"Trespassers killed and injured include persons struck by cars while walking or riding on city streets.

"The above figures are of interest, as the small number of accidents and their results show the high state of efficiency of maintenance and operation on the interurban railroads in this State. They also demonstrate by the large number of accidents and the number of persons killed and injured on city railroads that improvement in this direction should be made on these roads.

"The importance of the high-speed interurban railroad as a factor in the transportation facilities of this State has increased from year to year. At present there are several of this class of roads which on private right-of-way sections equal the speed of the fastest steam railroad trains. These roads are competing for the passenger traffic with the steam railroads and are securing a large portion of it.

"As an illustration of the density of some of this traffic, the Syracuse, Lake Shore & Northern Railway during the last State Fair carried between the fair grounds and the City of Syracuse in six days a total of 54,000 passengers, and a maximum of 13,000 in one day.

"On July 1, 1910, exclusive of electrified portions of the New York Central & Hudson River Railroad and the New York, New Haven & Hartford Railroad, there were 2709.57 miles of single track operated by electricity in this Public Service district, and 4118 cars in use.

"A number of serious collisions have occurred on interurban electric railroads outside this State. The volume of traffic, the speed and frequency of movements on the railroads in this district are equal to those of any other section of the country. The number of serious accidents on this class of railroads in this district has been comparatively few. The managers of these railroads are to be congratulated upon this fact.

"This comparative record is neither the result of good fortune nor chance but has been produced by the closest attention to all of the details of track and equipment maintenance; by the care taken to insure the employment of competent and reliable motormen and conductors; by improved methods of operation, including rules, train dispatching, and proper schedules. The high state of efficiency maintained on these railroads was brought about by the united efforts of the operating officials and the suggestions and recommendations of this commission."

UNIFORM ACCOUNTS

Regarding uniform systems of accounts the report says in part:

"The Public Service Commission was fortunate when it entered upon the discharge of its duties with respect to accounting in that it was able to profit largely by what had already been done in the field of accounting under the supervision of governmental authority. The public service statute of this State, however, contemplates a supervision of greater scope than has heretofore been delegated in this country to any similar body, and has within it purposes not generally provided for elsewhere. The commission therefore had in mind for an ideal accounting system one that would not only afford publicity and enable a correct analysis for statistical purposes, but would, in addition, conserve the public interest by preventing as far as possible those ills arising out of the inflation of capital which distort the relation of investment and earnings, and that stock jobbing the success of which is based largely upon the ability to manipulate a corporation's accounts.

"Systems of accounts designed to cover the operations of the corporations then under its supervision were adopted in 1908. After two years' trial it is believed that in themselves they meet the purposes for which they were made. That the subject is one of general interest is evidenced by the fact that the systems promulgated by this commission have been sought by public authorities, managers of corporations, accountants, and students in many parts of the United States, and in some instances by public authorities and others in foreign countries.

"A brief outline of some of the general purposes held in view in preparing these schemes of accounts may be stated as follows:

"1. The cost of the property of the corporations must be neither overstated nor understated. When property forming a part of the corporation's fixed capital or investment is acquired, it is to be charged to the capital accounts at its actual money cost, and when any of it is abandoned or otherwise retired from service the original cost must be credited to those accounts. The inflation of property accounts to meet bonus stock issues or discounts on securities, or for any other purpose, is not permitted.

"2. The accounts should reflect the sources and true amount of all income accruing to the corporations, showing the amount in such detail as will enable a comparison of the relative values of the different operations conducted.

"3. The expense of conducting the business should be classified according to the definitions established, and a clear line should be drawn between the operating expenses and capital expenditures.

"4. The revenues of each period should carry their own burden of expenses, and no more. This burden includes not only the cost of conducting the operations and keeping the property in repair, but in addition a proper charge for capital (property) consumed during that period, whether it is wholly or partially consumed. Where capital is partially consumed and its replacement is deferred through choice or necessity until a later period, the revenue should, nevertheless, suffer a reduction equivalent to the value of the capital that is actually consumed during that period.

"Of interest, as bearing directly upon the first proposition that the cost of property must be stated at its actual cost in cash, is the provision for discount suffered on securities sold and expenses connected with their issuance and sale. The rule

adopted requires that these items shall be provided for out of the income or the surplus of the corporation. That a thing costs whatever is promised to be paid at some future date is held by many and particularly by those whose interests lie in that direction. Others, less numerous, perhaps, maintain that it is right not only to measure the cost of corporate property by that standard, but to add to the cost thus stated the par value of certain securities which represent wholly or in part the beneficial interest derived through the hoped for division of expected earnings.

"Such charges as discount, commissions and other expenses incident to securing the investment of borrowed capital are recognized as necessary in the promotion and enlargement of certain enterprises; but when necessary they should, like interest, be provided for out of income, and like interest charges they should also be reasonable in amount.

"The rule established requires, among other things, that the depreciation in plant and equipment due to wear and tear, inadequacy, and obsolescence shall be included in operating expenses. While the greatest practical economy in operation is or should be held constantly in mind as worthy of encouragement, too frequently a reduction in expenses which is accepted in its full measure as representing economies effected means, in a large degree, a mere postponement of necessary expenditures for repairs and replacements. When for any reason it is desired to make a good showing for any period, or when a dividend is at stake, there is an incentive to pass over to the future burdens that the present should bear. Under this rule, however, each year is charged with its own expenses.

"Rates of depreciation must necessarily be based largely upon estimates, and the estimates in turn should be grounded upon past experience and the business policy of the corporation. Whether it is better to drive a machine to its fullest capacity and discard it when it reaches a certain stage of deterioration, or to prolong its life by prompt repairs and good care, is a matter of policy. The character and demand of the service to which a piece of property is devoted affect its life and vary with individual needs, climate, etc., but are factors that must be taken into account in arriving at a rate that is to be approximately correct. Manifestly, the determination of the rates of depreciation can best be done by those who have the shaping of the policy and a knowledge of the experience and purposes of the corporation; and for the present responsibility for making such rates has been left to the corporations themselves. Compliance with the depreciation rule of the commission has, however, so far, not been altogether satisfactory. While almost every one is willing to admit that all things human are perishable, that many of man's productions deteriorate very rapidly, and that inadequacy and obsolescence are constant sources of loss through the rapid advances in our industrial activities, it is surprising to find that many of the managers of those industries contend that there is no depreciation beyond what is covered by repairs, and in fixing upon a rate of depreciation as they are required to do, establish one that is only nominal. That it should be necessary to insist upon the creation of reserves which are for the sole benefit of the corporation and its owners does not appear to be reasonable, but one must take into account that a fixed depreciation rate has a tendency to restrict the power of its managers to make a concern appear more or less prosperous than it is in actual fact. Unless corporations shall more actively interest themselves in this very necessary matter, and more efficaciously carry out the spirit of the accounting rule in this behalf, it may become necessary for the commission further to exercise its power.

"The demand for uniform accounting has come in no small part from investors. Their interest is secondary only to the larger public interest. Those who advance money to a corporation upon its promise to pay, the security holders, have a right to know that the corporation has the ability not only to earn the interest agreed upon, but that it is able to and does maintain in good condition the property upon which the security rests. If dividends are paid without provision for wear and tear, inadequacy, and obsolescence, the property installed by stockholders' contributions and borrowed money is being returned to them, and when replacements or renewals become necessary the corporation finds itself obliged either to secure new loans or to increase its revenues."

PROBLEMS IN CAPITALIZATION

The report alludes to some of the more important questions which have engaged the attention of the commission during the year as follows:

"1. Capitalization of replacements: The practice of capitalizing replacements has been severely condemned by the commission in several written opinions. The effort to procure such capitalization continues somewhat, however, and it is made a point of jealous care by the commission that no such capitalization shall be authorized by it.

"2. Excessive proportion of bond issues to stock issues: There is a very strong tendency upon the part of corporations to make the proportion of bond issues to stock issues excessive. As is well known to all who have investigated the subject, such tendency is exceedingly dangerous and should be repressed wherever and whenever possible. It is not possible for the commission in all cases to obtain what it conceives to be the proper results in this class of cases.

"3. Capitalization of non-revenue-producing expenditures: There is a strong tendency on the part of many corporations to capitalize every possible expenditure. Experience confirms the theory that such a tendency should be checked and repressed wherever possible. The whole subject deserves careful treatment at the hands of the commission, which it hopes to be able to give in due course.

"4. Schemes to capitalize intangibles: Some corporations have submitted to the commission specious theories of capitalization of intangibles. Many intangibles are properly capitalizable. It is difficult to determine in many cases just where the line should be drawn between the intangibles which are capitalizable and those which are not. Great difficulty has been experienced in several cases in drawing the line of demarcation.

"5. Fixing values on reorganization: Some extraordinarily difficult questions have arisen as to the value of property upon the reorganization of bankrupt corporations. These questions have received very full and careful consideration.

"6. Reimbursement of the treasury: The Legislature of 1910 amended the Public Service Commissions law in such a manner as to admit of reimbursement of the treasury of a corporation for expenditures made for capital purposes paid for from income. These amendments are proper and were recommended by the commission. A greater degree of flexibility in financial operations has thereby been established, and so far no evil results have been noted in the practical working of these amendments. So far as has been observed the one thing which requires constant attention is the disposition in obtaining such reimbursements to endeavor to capitalize matters which under good practice should be paid for out of income."

Of the applications for the issue of securities which have been passed upon by the commission since July 1, 1907, the following relate to electric railroads: 1907, six months, bonds, etc., $100,000; 1908, stock, $14,230,200, and bonds $1,365,000: 1909, stock, $4,154,000, and bonds, $4,950,360; 1910, stock, $2,677,700, and bonds, $8,737,434.

DIVIDEND-PAYING AND NON-DIVIDEND-PAYING SECURITIES

A table showing the amount of stock on which dividends are paid and the amount on which no returns are made gives the following information regarding electric roads, based on the reports for the fiscal year ended June 30, 1910:

	Electric Railroads.	Combined Elec. Railroads and Electrical or Gas Corp'ns.
Total number of corporations	66	7
Number paying no dividend on common stock	54	5
Amount of common stock paying no dividends	$37,915,985	$3,150,000
Number paying no dividends on pfd. stock	9	1
Amount of pfd. stock paying no dividends	$8,125,000	$2,029,000
Total number paying no dividends	52	5
Number paying dividends on common stock	12	1
Amount of common stock paying dividends	$61,374,449	$500,000
Number paying dividends on pfd. stock	5	2
Amount of pfd. stock paying dividends	$8,432,372	$830,000
Total number paying dividends	14	2

RECENT PROGRESS IN CAR PAINTING

BY F. A. ELMQUIST, SHERWIN-WILLIAMS COMPANY

The essential problem of the car maintenance department is to keep the rolling stock in operating condition, but this does not imply that the durability and appearance of the car bodies should be neglected. It is not always appreciated that a car which is kept in proper painting trim has two positive advantages: First, it favorably advertises the company and so attracts business; second, it possesses the maximum durability which means ultimate economy. Perhaps one of the great deterrents to painting cars at more frequent intervals is the loss of service on account of their long stay in the shop. In discussing painting problems in general, it may, therefore, be of interest to begin with the subject of painting schedules.

PAINTING SCHEDULES

At present two systems of painting schedules are in extensive use, one of which is a fourteen-day, nine-coat process and the other a nine-day, six-coat process. The longer schedule is favored for new cars on account of the greater porosity of new wood. It is a standard rubbing system in which block pumice stone and water are used. This schedule is shown in detail in Table I.

TABLE I.—14-DAY, 9-COAT SYSTEM FOR THE EXTERIOR FINISH OF ELECTRIC CARS

First day—Prime.
Second day—Putty.
Third day—First coat car surfacer.
Fourth day—Second coat car surfacer.
Fifth day—Third coat car surfacer.
Sixth day—Rub (block pumice stone and water).
Seventh day—First coat color.
Eighth day—Second coat color.
Ninth day—Letter and decorate.
Tenth day—One coat of durable railway rubbing varnish.
Eleventh day—Let stand.
Twelfth day—First coat durable railway finishing varnish.
Thirteenth day—Let stand.
Fourteenth day—Second coat durable railway finishing varnish.

The large steam railroads have universally discontinued the use of rubbing varnish on the outside of the car, as have also a large number of electric lines. In some cases this is replaced by an extra coat of finishing varnish. This substitution would not change the time of the schedule given in Table I. A good many railways now, while requiring three coats of varnish on new equipment, give but two coats in the repair shop when the car is first refinished. Experience seems to commend this practice.

The nine-day process shown in detail in Table II is a six-coat system which has been adopted by several important electric railways.

TABLE II.—9-DAY, 6-COAT SYSTEM FOR THE EXTERIOR FINISHING OF ELECTRIC CARS

First day—Prime.
Second day—Putty.
Third day—One coat body leveling (knifed).
Fourth day—Sand and first coat body color.
Fifth day—Second coat body color.
Sixth day—Stripe and number.
Seventh day—First coat durable railway finishing varnish.
Eighth day—Let stand.
Ninth day—Second coat durable railway finishing varnish.

In this process the body leveling can also be used as a brush coat by thinning with turpentine to a brushing consistency, when a brush coat is preferred to the knifing coat.

Where speed is required it is possible in a well-ventilated shop to stripe and letter on the afternoon of the fifth day; to give the first coat of varnish on the morning of the sixth day and the second coat of varnish on the afternoon of the seventh day. This gives the same advantage in time that is obtained by some of the quick systems that have attracted some attention. While this practice may be safe in the majority of cases it nevertheless seems certain that it involves an element of risk which is not warranted except where the need to get the car in service again immediately is imperative.

There is probably but little difference in durability between the long and short systems given in Tables I and II. What difference there would be would theoretically be in favor of the system outlined in Table I. This opinion is probably confirmed by the fact that it represents almost the universal practice among the steam railroads and, to a large extent, among the electric railways. The system given in Table I will undoubtedly produce a better finish. On the other hand, the system given in Table II has the advantage of costing less for material and labor.

These two painting schedules also apply to steel cars, but in rubbing steel to a surface the users should avoid water and pumice stone. The best method is to employ a mixture of raw linseed oil and benzine and to do the rubbing with emery cloth. While this may not give so smooth a surface as water and pumice stone, no possible chance of starting corrosion can arise on account of rubbing through to the iron, which is unavoidable, and having water get around the rivets and open joints.

Some railroads are using the Enamelastic system shown in Table III on their steel cars. After the surfacing is done there is applied a first and second coat of Enamelastic finish with two coats of varnish. This gives better results than where a flat color is used, for in rubbing a steel car to a surface the men invariably rub through to the steel, more so than on wooden cars. By using the Enamelastic there is attained a much better adhesion to the metal where rubbed through than is possible with a flat color. The steam railways can use this method to better advantage than electric railways because they have less decoration and use dark colors. On the whole, this system gives better results on steel than the flat color system wherever it is practicable to use it. It is the best available standard for the durable painting of steel cars. This process requires 11 days, as is shown in Table III.

TABLE III.—11-DAY, 7-COAT ENAMELASTIC SYSTEM FOR STEEL CARS

First day—One coat steel primer.
Second day—Putty.
Third day—One coat surfacer.
Fourth day—Coat body leveling (knifed).
Fifth day—Sand (using two-thirds oil, one-third benzine and emery cloth).
Sixth day—First coat No. 1 Enamelastic.
Seventh day—Second coat No. 2 Enamelastic.
Eighth day—Letter and decorate.
Ninth day—First coat durable railway finishing varnish.
Tenth day—Let stand.
Eleventh day—Second coat durable railway finishing varnish.

This is cheaper than the 14-day, 9-coat method both in labor and material. With regard to the table, it may be added that in some cases the second coat of finishing varnish is not used, but the best results are obtained by applying the same, for thereby the cars can be kept in service for four months longer. The body-leveling coat should be knifed on letter boards, posts, belt rail and all panel work, but thinned to a brushing consistency with turpentine and brushed on all other work.

CHOICE OF COLORS

The most durable and economical colors for car painting, especially where re-shopping of cars is concerned, are the dark shades, such as Pullman, permanent Tuscan red, greens, and all solid opaque shades. With these shades, when a car is re-shopped, it is easy to cut in between the stripes where the panels are very much damaged or color-faded. This operation is almost impossible with the lighter shades because they are manufactured of a very heavy pigment and must be used heavy, and then will not cover with one coat. In late years it has been the practice of the railroads not to touch up a car when it is re-shopped, but to cut it in all over between the striping and lettering. Work done in this way makes the car look as if it were newly finished. There is no question, however, that electric cars painted with light colors look better for a longer time because the dulling of the varnish on a light color is not so apparent as on a dark color. The dark colors are best for electric cars, and look the richest only when a high varnish gloss is maintained and where revarnishing is properly kept up.

THE USE OF ENAMELS

There has been a great deal of talk about using enamels on electric cars, but I do not believe that this is practicable for the following reasons: First, the varnish color will not hold

its shade as well as a color which is applied flat. (This applies mostly to light colors.) Second, the use of light enamel colors involves extra cost, as it is necessary to apply one or two coats of flat color first to get the necessary covering qualities. When cars are re-shopped it is impossible to touch up or cut in with a varnish color. It has been the practice of some steam railroads to use enamels, and this is satisfactory in their case because steam cars usually have little decoration and their body colors are dark. Hence, when the cars are brought in for an overhauling they need simply to cut in or give one coat of enamel all over and revarnish. It follows from this that street railways should not use varnish colors unless they dispense with exterior decorations and light body colors.

MAINTENANCE OF WOODEN AND STEEL CARS

Daily washing with water can never hurt a car, even if it is customary to bring it in for a regular cleaning as often as every two weeks. The advantage of daily washing with water is that it immediately removes mud and dust, which may contain ammonia and other elements injurious to paint and varnish. With regard to the general cleaning of cars, there is no objection to using an oil car cleaner if the right men handle it. In most cases, however, the men employed for this work do not understand that the varnish will take up all the cleaner necessary for the good of the varnish and that all surplus cleaner must be thoroughly wiped off. If this is not done, dust and dirt will be caught and held in the cleaner, thereby injuring the varnish and giving the car a mottled, soiled appearance. Where an intelligent class of men are not employed to scrub cars it is preferable to use an oil soap which will not destroy paint and varnish. It is an axiom that any material that will eat dirt and grease without the use of elbow grease will eat off paint and varnish also.

TABLE IV.—DETAIL WEIGHT OF MATERIALS REQUIRED TO PAINT A VESTIBULE CLOSED CAR WITH 30-FT. BODY.

Carpenter or joiner's lead	20 lb.
Painting all framing	25 lb.
Car primer	7 lb.
Car surfacer	15 lb.
Putty	5 lb.
Body color (light colors)	20 lb.
Varnish (exterior)	22 lb.
Roof paint	55 lb.
Truck paint	10 lb.
Black for iron work	8 lb.
Sundries for stripes and decorations	2 lb.
Ceiling paint	25 lb.
Varnish (interior)	15 lb.
Floor and platform color	25 lb.
Filler and sundries	10 lb.
	264 lb.

With regard to the general re-shopping periods of cars, it is advisable that a new car should not be allowed to run over 12 months before returning to the paint shop. After the first re-shopping, it may be kept out for longer intervals, say 16 months. It is understood, of course, that such a car must be painted and repainted with a first-class system and best material throughout.

Some electric railways appear to be much concerned about possible painting troubles with steel cars. The experience of steam railroads, however, shows that the painting of such cars can be maintained for about the same cost as wooden cars. Neither the steam railroads nor such pioneer users of electric steel cars as the Interborough Rapid Transit Company, New York, have had any special difficulties with the painting of them. Experience with steel cars to date has proved that if they are finished with first-class material under favorable conditions there is no reason why the results should not be as satisfactory as on wooden cars. The painting of steel passenger cars really is a comparatively simple problem when one considers how successful has been the painting of locomotive tenders which operate in a smoke-laden atmosphere.

WEIGHT OF PAINT ON CARS

There is an impression quite current among railway men that paint adds a considerable item to the weight of a car. Thus an editorial entitled "Weight of Car Paint and Varnish" in the Electric Railway Journal of Sept. 17, 1910, stated that a certain double-truck closed car with prepayment platforms required nearly 600 lb. of finishing surface. It is difficult to understand just why so much paint was required in this case. In my experience, 225 lb. to 300 lb. is ample for a vestibule closed car with 30-ft. body. In general, 250 lb. is all that can be used with the best results on new cars. It would be impossible to paint a new car well with much less, and it would be useless to employ more. Less than 100 lb. of painting materials usually is enough for cars which are re-shoped.

The accompanying Table IV gives an idea of the weight of the different materials required for the painting of 30-ft. closed cars.

In this case, the amount will vary between 225 lb. and 300 lb. The difference in weights is due to the fact that light colors weigh more than dark, and it also depends upon whether or not the ceiling is painted. It will be observed from the above table that even the carpenter's or joiner's lead has been included so that it cannot be said that any legitimate weights have been overlooked.

IMPROVEMENTS OF THE NORTHERN OHIO TRACTION & LIGHT COMPANY

Important improvements are planned by the Northern Ohio Traction & Light Company, Akron, Ohio. They include a large new power house, a car house and shops, and the construction of additional single and double track on private right-of-way.

The company owns a tract of 178 acres at Akron on which there is an amusement resort called the Gorge Park, and the power house will be built at this point. A subsidiary company, the Northern Ohio Power Company, has been organized to conduct the work of construction, and William Ellsworth Davis, consulting engineer, Cleveland, has been engaged as engineer in charge. It is expected that the plans will be completed within a few weeks. The Cuyahoga River flows through the gorge and a 50-ft. dam will be built to form a reservoir for water-power purposes. There will be a head of 105 ft. and provision will be made for 2000 kw of hydroelectric capacity. The power house will also be equipped with a steam turbine of 10,000 kw capacity and boilers of 7500 hp capacity. Preparations will be made for the addition of another 10,000-kw turbine later. The company is now operating three power houses on the northern division, which extends from Akron to Cleveland, and these will be abandoned when the new development is completed. Power for the Canton-Akron line, as well as the northern division, will be generated at the new power house. Substations equipped with 750-kw rotary converters will be built at Bedford, Town Line, Akron and Barberton. The Kent-Ravenna division will be operated by a storage battery plant.

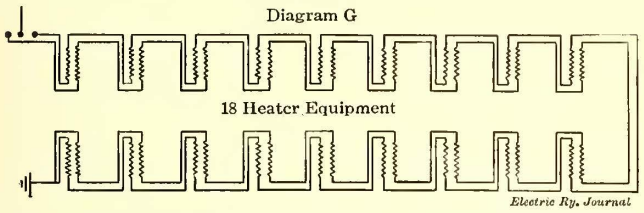
For the proposed new car house and shops the company has purchased a tract of land in the southern part of Akron. Modern shops will be constructed and storage capacity provided for about 100 cars. The plans for this development will follow somewhat those of the new car house and shops at Syracuse (N. Y.) of the Oneida Railway, which were described in the Electric Railway Journal of Nov. 6, 1909.

The company expects to complete the double track on the division between Cleveland and Akron. Of the total distance of 36 miles between these two cities, about 16 miles will be double-tracked and this will complete the work. In this work 80-lb. rails will be substituted for 56-lb. rails, and the entire line will then have 70-lb. and 80-lb. rail. The track between Akron and Canton will be straightened and nine curves will be eliminated. About 8 miles of the 21 miles of road between Akron and Canton are now on private right-of-way and the elimination of the curves will add about 2 miles to the portion built on private right-of-way.

The foregoing information has been received from Charles Currie, second vice-president and general manager, Northern Ohio Traction & Light Company.

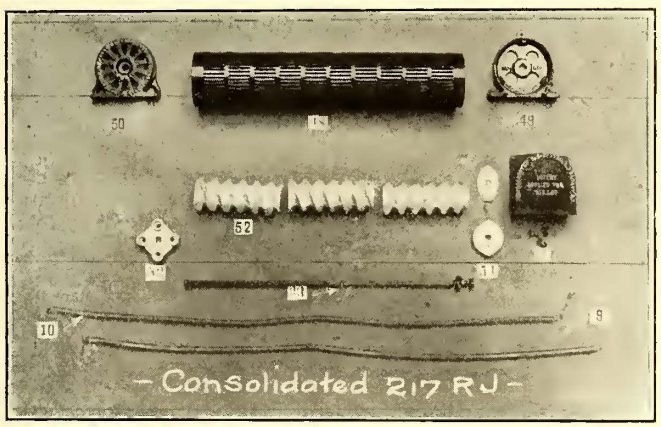
SPECIALIZING ELECTRIC HEATER MAINTENANCE IN BROOKLYN

The mechanical department of the Brooklyn Rapid Transit System inaugurated this winter the specialized maintenance of electric heaters. Formerly the regular maintenance force was employed for this work, but it was found that some of the men did not have enough knowledge of the construction and



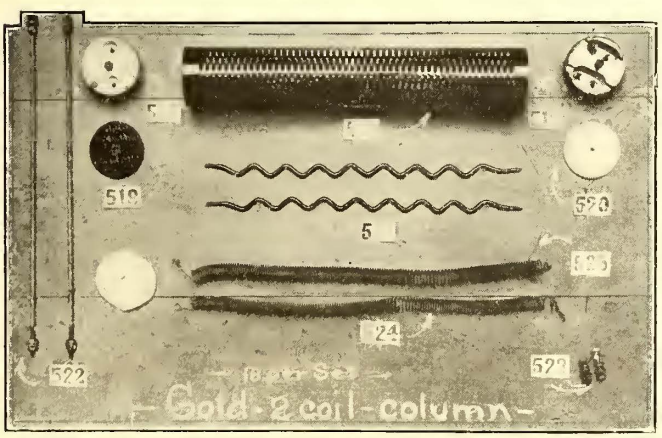
Coils of the Consolidated 217 R J and Gold Two-Coil Column Heaters

the circuit arrangements of the heaters to do the most effective work. This practice has been changed by employing three heater experts, two for the surface division and one for the elevated division. These men go from depot to depot in turn until all of the heaters on the system have been examined and



Supply Parts of Consolidated 217 R J Heater

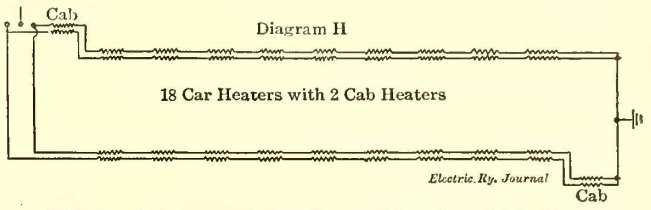
put into first-class condition. In order to make accurate investigations the men are provided with a low-reading ammeter and a voltmeter. The ammeter is used to check up the current consumption at the different switching points. If the current consumption varies widely from the standard the coils



Supply Parts of Gold 2-Coil Column Heater

and their connections are examined. The voltmeter is used to get the drop of potential across the heaters and to ground; also to trace the connections when determining if wrong coils are in the heater or if right coils are misplaced. The heater specialists are furnished with a descriptive schedule of the various types of heaters on the system with accompanying wiring diagrams so that the heaters can be readily identified and be correctly connected. Two typical descriptions and diagrams are presented in this article.

It will be noted from the instructions that an allowance is made for the increased current consumption of heaters on account of their aging in service. In some instances, however, the original ratings were too high, so that no excess current ratings are now required.



Wiring Scheme of the Consolidated 146 X Heater

CONSOLIDATED 217 R. J. HEATER.
Cross-Seat Heater with Junction Box 23 in. long,
Double Coil, Single Spindle,
18 Heaters per Car.
Diagram G.

Original current consumption, 4-8-12 amp. Allowable amount on account of aging, 4.2 to 5 amp on first point and 8 to 9 amp on second point.

CONSOLIDATED 146 X HEATER.
Panel Heater, Two Spindles, Punched Steel Front.
18 Car Heaters, with 2 Cab Heaters, 118 W. and 146 G.
Diagram H.

Original current consumption, 6-12-18 amp. Allowable amount on account of aging, 6.5 to 7 amp. on first point and 13 to 14 amps on second point.

GOLD TWO-COIL COLUMN HEATER.
Cross-Seat Heater, Two Coils.
18 Heaters per Car.
Diagram G.

Original current consumption, 4-7-11 amp. Allowable amount, 3 to 4 amp on first point and 6 to 7 amp on second point.

To minimize errors in orders from the shops for heater supplies the mechanical department has prepared a series of numbered photographs of the several parts of each type of electric heater in service. Two sample groups are reproduced in the accompanying illustrations. A bound set of these photographs is furnished to each shop and storeroom. The photographs were made direct from disassembled heaters in the shops of the Brooklyn Rapid Transit System.

LOCOMOTIVE SMOKE IN CHICAGO

On Feb. 15 Paul P. Bird, smoke inspector of the City of Chicago, presented before the Western Society of Engineers a paper entitled "Locomotive Smoke in Chicago." The study, made with a view to determining the relative density of smoke in the territory adjacent to various steam railroads, Mr. Bird said "indicates very strongly that electrification offers the only final and satisfactory solution of the locomotive smoke problem. The use of special fuel for preventing smoke from steam locomotives is only a makeshift and will not satisfy the public." Mr. Bird's paper first called attention to the low grade of bituminous coal used by the railroads and manufacturing plants in and about Chicago. It is often stated by railroad officials that the railroads make a very small proportion of the total smoke and that from the standpoint of smoke prevention the electrification of railway terminals is unwarranted. Mr. Bird's paper described the investigations made by the Department of Smoke Inspection of the City of Chicago to determine the proportion of total smoke made by the railroads. The results of this study may be summarized as follows:

(1) Although the locomotives in the city use only 18.5 per cent of the total coal, they make 43 per cent of the total smoke and over one-half of the total dirt.

(2) The locomotives consume within the city limits 5600 tons of soft coal daily.

(3) According to the Ringlemann system of judging the density or blackness of smoke, the average density of locomotive smoke in Chicago is 23 per cent.

(4) The lowest average density of smoke produced by any one road is about 10 per cent. This figure probably represents as low an average as can be maintained with steam locomotives using soft coal.

PRESIDENTIAL TRAIN ON THE ILLINOIS TRACTION LINE

As the guest of Congressman William B. McKinley, president of the Illinois Traction System, President Taft made a trip over the interurban lines of that company from Decatur to the State House at Springfield, Ill., where he was the guest and principal speaker at the Lincoln Centennial Association. The trip was made in the official car of the vice-president executive of the Illinois Traction System, H. E. Chubbuck, to which was attached the private car of Mr. McKinley. No attempt at speed was made, as lunch was served en route and the distance of 40 miles was made in one hour and a half.

Careful preparations had been made by officials of the Illinois Traction System for the safety of the chief executive. All opposing train movements were stopped when the special left Decatur and no train was allowed out of that city until the presidential train had passed Mechanicsburg Junction half way to Springfield. All switches were spiked and a flagman was stationed at every highway crossing. Two flagmen were placed at each railroad crossing and the track was patroled the entire distance. A pilot car preceded the presidential train by 10 minutes. In the cab with the motorman of Mr. Chubbuck's car was General Superintendent C. F. Handshy, and J. M. Bosenbury, superintendent of equipment and motive power, was on the train with a kit of tools. The dispatching was attended to by J. R. Gilhuala, superintendent. A special was also run out of Springfield the same day and carried Governor Deneen, State officials, members of the legislative committee and newspaper men to Decatur. Returning a party of newspaper men and other guests occupied the pilot car. Lunch was served in all three cars.

A COMPANY PUBLICATION IN SHEBOYGAN

The Sheboygan Railway & Electric Company has commenced the publication of a small company pamphlet entitled "Sparks from the Wire." Its purpose is clearly set forth in the salutatory story on the first page, which, somewhat abbreviated, follows:

"The Sheboygan Railway & Electric Company has for a long time wished for some medium whereby it could communicate with its customers and friends, as well as its near-friends, in some direct manner, without doing so through the ordinary mediums of communication. The publication of a company magazine, or what is generally known as a 'house-organ,' is the best way of accomplishing this purpose, but, unfortunately, it is a very expensive plan. Nevertheless, the company has decided to risk the expense, and if there is not talent enough in the company to make this publication readable and interesting to our customers then it deserves to die a natural death, and the sooner we know it the better. There is no one individual who is the sole editor of the paper. It is contributed to by the entire staff of the company, and it is intended for reading by the company's employees as well as by the public generally.

"We hope to be able to say a great many things which we cannot say either in the advertising columns or news columns of the ordinary newspapers. This is not any fault of our friends the editors of the various newspapers, but is due to causes entirely beyond their control. They have their own interests to serve and they cannot blow anybody's horn overly much, and particularly not that of any corporation. We pay our compliments to these editors and hope to keep on the friendliest footing with all of them.

"Oh, yes, we will not deny it—occasionally we shall have something to say about politics and politicians, and we hope that mostly it will be pleasant reading—for them. The company has no quarrel with the city administration as such; we respect most of these officials very highly. It so happens that at this time we have a mayor who does not like the street railway management, but that does not worry us any more than would the bite of a hungry fly at the end of the fly season. If the mayor chooses to use lawless threats and grand-stand methods, we do not resent it—for we all, corporations and politicians, get our life from the public and it has been our experience that the public as a whole can be trusted to do right. If we are wrong, we expect to be punished, and deserve to be. If the mayor is wrong, he 'will get his good and plenty' whenever the public wakes up. So we are serene and smiling and without a care about politics and politicians. We wish them all a happy new year.

"To our customers and friends we extend the greetings of the season with our compliments and thanks for their favors. We promise to do all we can to promote their interests and those of the city and county of Sheboygan. We bow and say 'How do you do?' to all and hope the answer will be as one man, 'Pleased to meet you.'"

In addition, the first issue contains articles on "That Interurban Schedule," "Accidents," and "Fixed Charges Explained." The latter article describes the method followed by the company in charging for light and power.

IMPROVING RESISTANCES IN BROOKLYN

The Brooklyn Rapid Transit System is working toward the elimination of old-type grid resistances with the object of standardizing the installations on 272 single truck cars of open and closed types, 507 double truck closed cars, 750 double truck open cars, and 563 double truck semi-convertible cars. This list embraces more than one-half the surface rolling stock in service. The new equipments are of the Westinghouse three-point suspension type. The old resistances had 60 grids, but although the new ones have only 48 their total capacity is greater. The resistance steps have been so arranged that the current on the first notch will be low enough to avoid jerky starts. In series running the maximum current will be obtained on the third point, and in parallel running on the last point, notching at the rate of one second per point. The accompanying tables show the resistance steps for double truck cars with two motors, K-11 controllers and three-point suspension resistances, the total amount of resistance in circuits at various points and other data.

RESISTANCE STEPS FOR DOUBLE TRUCK CARS WITH TWO MOTORS, K-11 CONTROLLERS AND THREE-POINT SUSPENSION RESISTANCE.

Point.	Connection.	Ohms.
1	R_1 to R_5	4.416
2	R_2 to R_5	2.40
3	R_3 to R_5	1.12
4	R_4 to R_5	.48
5	Full Series	All out
6	R_2 to R_5	2.40
7	R_3 to R_5	1.12
8	R_4 to R_5	.48
9	Full Multiple	All out

WESTINGHOUSE THREE-POINT SUSPENSION RESISTANCE GRIDS USED ON DOUBLE TRUCK CAR WITH TWO MOTORS AND K-11 CONTROLLERS.

From.	No. of Grids.	Pattern No. of Grids.	Resistance Each, Ohms.	Total Resistance, Ohms.	In Circuit on Points.
R_1 to R_2	16	N-3210	.126	2.016	1
R_2 to R_3	16	N-3353	.08	1.28	1-2-6
R_3 to R_4	8	N-3353	.08	.64	1-2-3-6-7
R_4 to R_5	8	N-3354	.06	.06	1-2-3-4-6-7-8
				4.416	

The new installations are being made on a renewal basis only. The old resistances removed are being used for the maintenance of other cars which are still equipped with the old types.

TROLLEY-ADJUSTING DEVICE

A simple device used by the Chicago City Railway Company for obtaining uniform tension between the trolley wheels and wires consists of two wooden rods with a spring balance hooked between them. On the end of the upper rod is a hook which is inserted in the trolley harp. Another hook on the lower rod fits the end of the car hood, and thus the device serves to hold the trolley wheel at the regular operating height. It is the practice to keep the trolley base spring so adjusted that the wheel bears against the wire at a pressure of 22 lb. When using this simple device the workman can stay on the car and observe the tension while he adjusts the springs.

NEW OFFICERS FOR THE ST. LOUIS CAR COMPANY

A special meeting of the stockholders of the St. Louis Car Company was held Jan. 31, at which all of the stock was represented and a new board of directors was elected, consisting of John I. Beggs, Capt. Robert McCulloch, E. B. Meissner, Richard McCulloch, George J. Kobusch and W. S. McCall. These directors were elected in pursuance of an agreement by which Mr. Beggs and others consented to purchase a certain amount of preferred stock of the company at par and the commercial creditors of the company agreed to take in payment for their claims preferred stock at par. In accordance with this arrangement it is understood that Mr. Beggs individually has purchased from the company for cash 7500 shares of the company's preferred stock at par, amounting to $750,000, and that others associated with him have purchased preferred stock to the extent of about $300,000. Mr. Beggs is also understood to be a large holder of the common stock of the company.

About $600,000 was required to liquidate the indebtedness of the company not provided for by the issue of preferred stock to the creditors, so that the company now has about $450,000 actual cash in its treasury as a nucleus of a working capital. This places the company on a substantial financial basis. As soon as the floating and commercial indebtedness of the company has been paid off, which will be done as rapidly as possible, the company will have no indebtedness except an outstanding bond issue of $1,000,000 in 6 per cent bonds and a small land purchase mortgage of $40,000 on its automobile plant. The amount of outstanding 7 per cent cumulative preferred stock will then be $1,600,000.

At the meeting of the board of directors held after the stockholders' meeting, Mr. Beggs was elected president and general manager of the company, and he will have general charge of its affairs, financial, administrative and operative. George J. Kobusch was elected chairman of the board of directors and will give his attention principally to the sales department of the company. J. M. Taylor, formerly assistant secretary and treasurer of the company, was elected secretary and treasurer. The office of vice-president was not filled. E. B. Meissner was appointed assistant to the president.

Every effort will be made under the new management to place the plants of the St. Louis Car Company abreast of the best in the country, and it is expected that owing to the acquaintance of those in charge of its affairs with the requirements of electric railway companies the company will be able to supply equipment equal to that of any other company and fully up to all guarantees which are made in its behalf. The company has a large and well-equipped car building plant which in 1907 turned out $6,000,000 worth of work. In addition it owns the factory formerly belonging to the Laclede Car Company and also has a very finely equipped factory for building automobiles. The machinery in this factory is understood to be worth approximately $500,000. It is the intention of the company to put this automobile plant in operation as promptly as possible, as the "Standard Six," the name of the automobile manufactured by the company, is a well-known and widely used type of machine. In addition to building this automobile it is the company's intention to develop and build a complete line of commercial automobile trucks.

At the present time the company is working in its car factory upon 100 large pay-as-you-enter city cars, semi-steel construction, 51 ft. over all in length, for the Milwaukee Electric Railway & Light Company. It is also completing 100 cars for the Los Angeles Company and is under contract to build 100 additional cars for the Los Angeles company similar to those now going through the shops. It also has other contracts on its books, but is in position to fill orders promptly.

The Chilean government commission appointed about a year ago to study the question of electrifying the government railway between Valparaiso and Santiago has made a favorable report on the project and the matter is now before Congress for its approval.

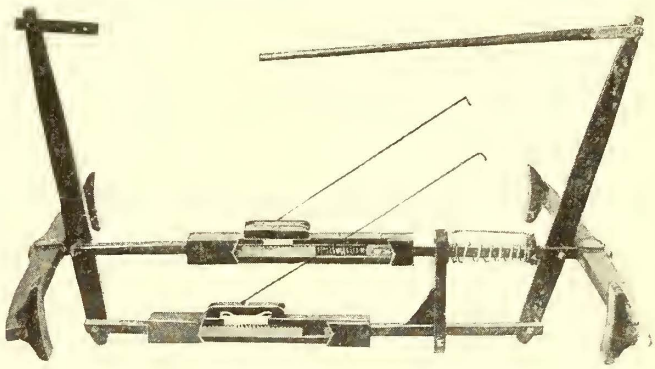
CONSOLIDATION OF ILLINOIS AND CENTRAL ELECTRIC RAILWAY ASSOCIATIONS DISCUSSED

A meeting was held in Chicago on Feb. 11 at which representatives of the Central Electric Railway Association, the Central Electric Traffic Association and the Illinois Electric Railway Association were present to discuss the advisability of consolidating the organizations of the two adjacent territories. At an earlier meeting of the Illinois association H. J. Vance, general superintendent Chicago, Ottawa & Peoria Railway, and B. E. Merwin, general superintendent Aurora, Elgin & Chicago Railroad, were appointed to meet the representatives of the Central Electric associations and report on the advisability of consolidation. At the conference on Feb. 11 the Central Eletcric Railway Association and the Central Electric Traffic Association were represented by E. B. Peck, president, J. H. Crall, F. D. Norviel, F. I. Hardy and C. C. Collins.

The representatives of the Central Electric associations brought with them data regarding the work of the traffic association, sample tariffs, maps, etc., to show how well conducted have been the affairs of this association and how great assistance the organization has been to its member roads. The Illinois men took notes on the points presented and, it was understood, will present a written report to their association at its meeting in Chicago on Feb. 17.

AUTOMATIC RATCHET-TYPE SLACK ADJUSTER

A. R. Duffy & Company, Manhattan, Kan., have recently brought out a slack adjuster in which a ratchet construction equalizes the brake-shoe wear and regulates the brake piston travel. The construction and application of this adjuster is shown in the accompanying cut. The lower mechanism between the live and dead levers comprises the slack adjuster; the upper mechanism comprises the retainer. Both parts are



Ratchet-Type Brake Slack Adjuster

connected by a yoke which slides freely on the upper rod but is rigidly fastened by a friction clamp to the lower adjuster rods.

The mechanism of each ratchet embraces a pawl; a toothed piston rod which engages with the pawl; a slotted eye to limit the movement of the shoes, and the housings to protect the parts from mud and dust. In addition the toothed rod of the retainer is connected to a coil spring. The retainer rod also carries a chain which limits the back-throw of the live lever and prevents one ratchet from taking up any slack greater than the movement of the other ratchet. This chain is attached to the clamped spring-stop on the retainer piston rod and to a hook on the yoke connecting the upper and lower rods.

The pawl of the adjuster mechanism is controlled by a flat spring which can be released by an upper eye bolt. The rods for releasing, for changing the brake shoes, etc., are run from this eye bolt.

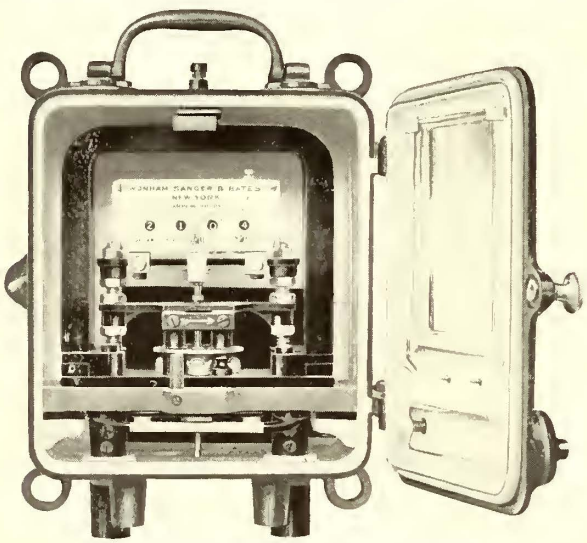
The release of the brakes and the movement of the ratchets occur through the operation of the outer spring on the retainer rod. The tension of this spring is adjusted by moving the yoke or the spring clamp along the rod. The yoke can be

eliminated by attaching the same spring to the junction of the live lever and the main brake rod.

This outfit is installed by cutting out of the lower brake rod a piece equal to the length of the ratchet. If it be assumed in practice that the brake is very slack, the setting up of the brakes will cause the retainer rod to be pushed inward from the brake beams. Then, when the brakes are released, the eye slot permits the brake shoes to fall away from the tread of the wheels for a slight distance. The outer spring on the retainer rod will then pull the brake lever back. It will also pull the retainer in the same direction at the same time, thereby pushing the slack adjuster in the opposite direction and so taking up the slack. When inside brake rigging is used the ratchet works in the opposite direction.

AMPERE-HOUR METER FOR CHECKING CAR OPERATION

The use of some form of meter to check the operating characteristics of motormen has been common practice abroad for some time and it is now being taken up in this country. Some of the instruments are shunt-current clocks which register either the current-on or coasting intervals; others are purely electrical devices like watt-hour and ampere-hour meters. The ampere-hour meter is especially popular among British tramways, some 85 per cent of which are using a type made by Chamberlain & Hookham, Ltd., Birmingham, Eng. The excellent results secured by means of this meter have finally led to its introduction to the American electric railway field by Wonham,



Ampere-Hour Meter for Car Service

Sanger & Bates, New York, who also introduced the "H-B" wheel guard. The following paragraphs will present a description of this meter and of its installation and give typical examples of its ability as a current and brake-shoe saver.

The "C-H" ampere-hour meter is of the mercury motor type, consisting essentially of a permanent magnet between the poles of which revolves a copper disk submerged in mercury. This disk or armature is slotted radially to prevent eddy currents and also to concentrate in a straight path the current to be measured. Mounted on the same spindle as the armature disk is another and larger disk which revolves between other pole pieces of the same magnet and in magnetic parallel with the pole pieces between which the armature revolves. This second disk acts as a Foucault brake to control the speed of the meter. The rotation of the armature is communicated through pinion and gears to a "jump" counter which registers ampere-hours. Simple means are provided to set the dial to zero by authorized persons.

A correction coil which counteracts the braking force is used to compensate for the fluid (mercury) friction which occurs when the meter is working on lighter loads. This coil decreases the braking effort (therefore speeds the meter) as the square of the current passing; and as the fluid friction rises as the square of the speed, which in turn is proportionate to the current passing, the two opposing factors exactly balance each other.

Permanence of calibration is insured by using a special grade of tungsten steel and by employing a magnet of great length and sectional area in proportion to the air gap in the magnetic circuit. The rotating element is very light and floats in mercury. Inertia, therefore, is almost non-existent in this meter. The mercury forms an ideal cushion to prevent the bottom pivot from being affected by the jarring of the car—consequently no spring suspension is necessary.

The meter is shipped to the user with the mercury chamber empty, the correct amount of mercury being sent with it in a separate bottle and then installed according to simple directions. The two meter terminals can be connected into the main circuit anywhere between the trolley pole and the controller. The meter is attached in a vertical position by means of screws passing through porcelain insulators to the woodwork of the car. Each meter has an inside paper label containing the "testing constant" which is used for standardizing the meter.

The financial value of this ampere-hour meter will be appreciated by noting the results obtained on one large and one small English tramway. Thus, under date of Dec. 15, 1910, Alfred Baker, general manager Birmingham Corporation Tramways, wrote the meter maker that in July, 1910, 300 cars on his system as operated over three routes had shown respective current savings of 15 per cent, 16 per cent and 16½ per cent. Mr. Baker estimated that this was equivalent to an annual reduction of £10,000 in energy cost and 33⅓ per cent in brake-shoe labor and material outlay. He found that the meter encouraged careful and economical car operation and that it enabled a manager to detect both careless motormen and defective cars. Another letter, written on Dec. 21, 1910, by T. B. Goodyear, manager of the Croydon Corporation Tramways, mentions a current reduction of about 25 per cent in the operation of 50 cars. From April 1 to Dec. 16, 1910, inclusive, this was equivalent to a saving of practically £4,006. The saving in brake shoes was about £25, while the cost of maintaining the meters was nothing.

SINGLE-PHASE RAILWAY DEVELOPMENTS IN AUSTRIA

Work in various stages of completion is now under way in the single-phase electrification of several Austrian narrow gage and standard gage railways. One of the first electric lines is a 50-km (31-mile) standard gage branch line from Waizen to Budapest and Gödöllö. This line is furnished with passenger cars of 300-hp motor capacity and freight locomotives of 480-hp motor capacity each. The trolley potential is 10,000-volt, 15-cycles. The Mittenwaldbahn now under construction will furnish a shorter connection between Munich and Innsbruck, via Partenkirchen and Seefeld. This line is 102 km (63.24 miles) long and one-fifth of the entire distance has a maximum grade of fully 3.5 per cent. It is intended for operation with locomotives of 800-hp motor capacity each, using 10,000 volts, 15 cycles. During the years 1908 to 1910 the St. Pölten-Mariazell-Gusswerk narrow gage branch railway 91 km (56.42 miles) long was converted for 6000-volt, 25-cycle, single-phase operation with locomotives of 500-hp motor capacity each. A project now under way is the electrification of the standard gage branch railway from Vienna to Pressburg. This line will be 68 km (42.2 miles) long, of which 19 km (11.8 miles) will be operated on direct current in the terminal districts.

The *Light, Railway and Tramway Journal,* London, England, has published its annual Diary for 1911. In addition to the blank pages for entering the events of each day in the year the volume includes a directory of officers of all the central stations, steam and electric railways and manufacturers of electrical apparatus in Great Britain, a directory of German tramways and lists of officers of the principal technical societies of the world. Miscellaneous articles on electric railway subjects occupy 32 pages.

THE "ROLLWAY" RIGID AXLE CAR WHEEL

The article on the Beach-Edison storage battery car published on page 1068 of the ELECTRIC RAILWAY JOURNAL for Nov. 26, 1910, contained a brief reference to its equipment with non-rotating axles and the new "Rollway" wheel of the Railway Roller Bearing Company, Syracuse, N. Y. The following details of the design and merits of this anti-friction traction device as arranged for gear or chain drive have now been made available by this company.

Of the accompanying illustrations, Fig. 1 shows a "Rollway" wheel with the truck frames placed inside the wheels. This was practically the design made for the double-truck accumulator car previously mentioned. Fig. 2 shows a form where the axle extends through the wheel and the truck frame rests on the axle outside the wheel. The end thrust in this pattern is taken at opposite ends of the journal sleeve, while in the first design the end thrust is taken in both directions at the outer end of the journal. Fig. 3 shows the "Rollway" wheel hub with a seat for the gear at the inner end and provision for a rolled steel wheel or chilled iron wheel to be pressed on the hub against a shoulder.

The wheels in the original design, as illustrated in Fig. 1, were made of a single steel casting which included the hub, and the steel tires were shrunk on. The end covers were made of a special grade of malleable iron and the roller raceways of nickel steel hardened and ground like this company's journal boxes.

The elimination of flange friction on curves is apparent in the operation of the car which is equipped with these wheels. This appears not only in the absence of grinding when rounding curves or passing through switches, but also in the exceptionally low power consumption. It will be noted from Figs. 1 and 2 that the two lines of rollers placed within the wheel are spaced wide apart in order to counteract any gage-distorting leverage which may be exerted at the flange of the wheel and the rail. The double thrust, of course, prevents any longitudinal movement of the wheel on the axle. The journal sleeve in this wheel presents a different condition from the "Rollway" journal box, in that the pressure of the rollers in the wheel is always against the bottom of the journal, while in the rotating journal this pressure is distributed around the entire circumference of the journal sleeve. Thus far there has been no evidence of wear of the journal sleeve, but should this eventually develop the sleeve may be shifted readily on the axle from time to time in order to bring a new arc under pressure.

The central portion of the wheel affords such a large reservoir capacity for oil that the wheels are expected to operate for a year with one lubrication. During the first six weeks

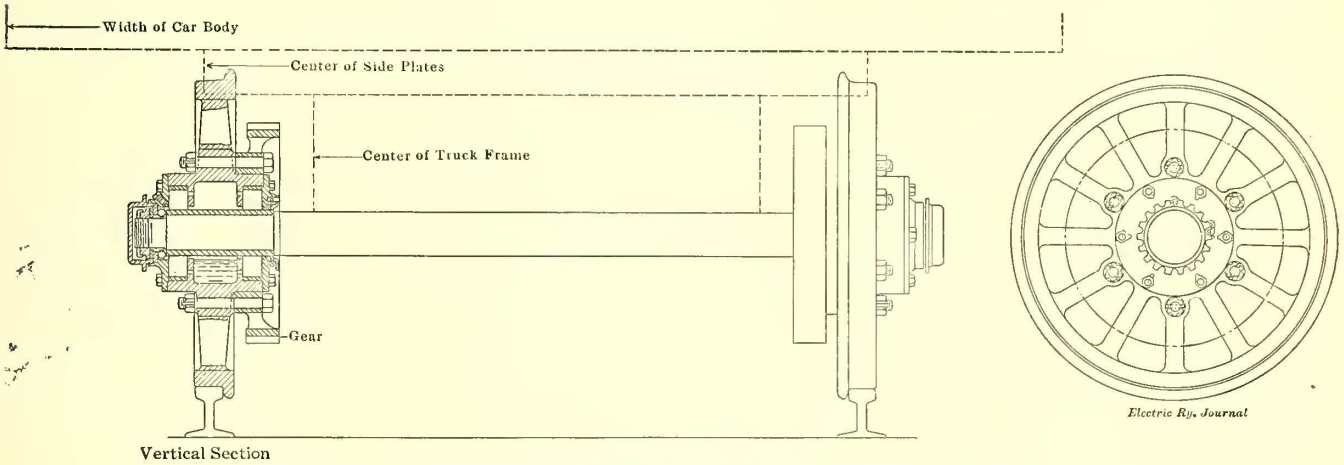


Fig. 1—Section, Side View and End View of Roller-Bearing Car Wheel

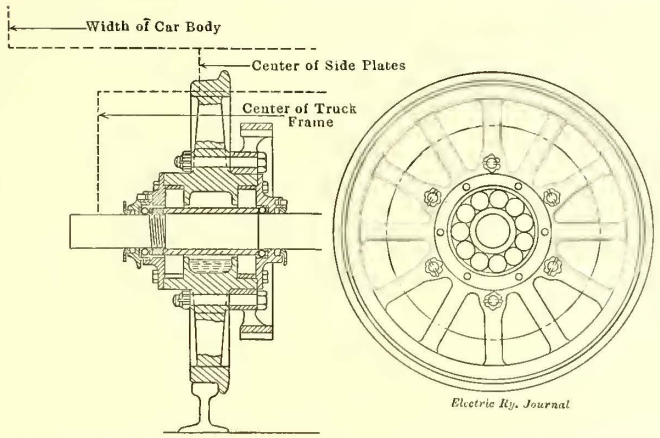


Fig. 2—Roller-Bearing Car Wheel with Extended Axle

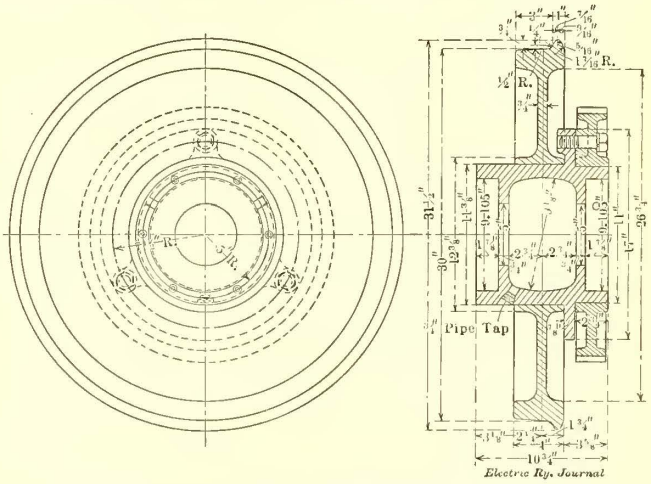


Fig. 3—Details of Roller-Bearing Car Wheel

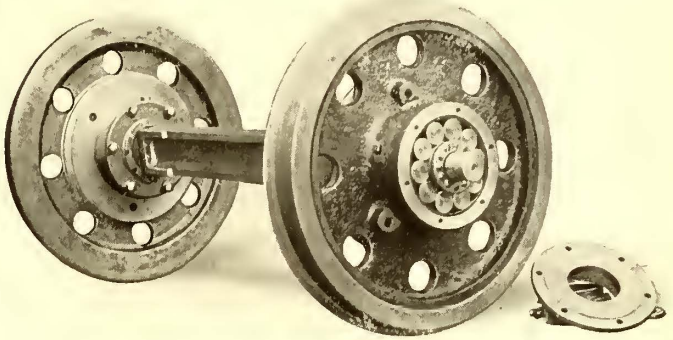


Fig. 4—Roller-Bearing Wheels and Axle

of the test runs with the storage-battery car one of the driving wheels operated without any lubrication, and yet it developed no high temperatures, nor did it show any abrasion of the roller or raceway surfaces.

From the evidences thus far obtained it appears that these wheels not only will prove durable, but will also show a considerably higher efficiency even than this company's journal. Reducing the various results to a common watt-hour per ton-mile basis, the tests showed a saving of 34 per cent for "Rollway" journal boxes in current consumption as compared with plain journals and 51 per cent saving for "Rollway" wheels as compared with plain journals. The car and track conditions, however, were not identical in all cases, so that these results can be considered only as approximate.

THE LIFE AND COST OF GEARS AND PINIONS

The life of gears and pinions is very difficult to estimate owing to the great variations in tooth pressures and pitch line speeds even on the same size motor with different gear ratios, differences in lubrication methods, condition of bearings and gear case, and to the misleading results obtained with pinions running with new or half worn-out gears. As showing the wide variations in the life of gears and pinions the following data taken from the records of the R. D. Nuttall Company are of interest. The highest grade of oil-treated carbon steel pinions have worn out after running 10,000 miles, while other pinions of the same grade have made as high as 60,000 miles in the same service. One road which has in service 40 40-hp motors with a gear ratio of 15:69 repo[illegible] two pinions and no gears changed after running an average of 140,000 miles. The average life of 14-tooth pinions on another road is from 25,000 miles to 30,000 miles.

While the life of gears and pinions in any particular service cannot be accurately forecast, some measure of the wearing qualities of different grades of steel can be had by comparing their relative hardness or elastic limits. This conclusion has been reached by the R. D. Nuttall Company after examining the records of large numbers of gears in actual service. Using the standard cast steel or machinery steel pinion as the basis, the following table shows the comparative first cost and estimated life of five grades of gears and pinions made by this company:

Grade.	First Cost.	Life.
Standard cast or untreated machinery steel	100	100
Special cast-steel gear or N. S. pinion	108	133
X. X. cast-steel gear	127	160
S. S. pinion	148	200
Case-hardened gear or pinion	200	300

It will be seen that the cost and life do not increase in the same ratio. The highest-priced pinion is the most economical in any service where the standard pinion will last less than four or five years. Where the service is less severe and the maintenance and lubrication are better the lower-priced gears and pinions will show a marked saving.

WIRE-TYPE TUNGSTEN LAMPS

The constant increase in the demand for tungsten lamps on account of their economy and extreme high efficiency has been accompanied by a demand for a lamp of greater ruggedness. Under the old processes of manufacture where it was impossible to obtain filaments in long lengths it was necessary to make the lamps up out of a large number of short lengths bent in the form of an elongated U, each end of this U-shaped filament being connected to the leading-in and anchor wires by fusing the metal of the leading-in and anchor wires around the tungsten filament. The support of the tungsten filament in this way by a large number of rigid fused joints caused a great many early failures because the filaments broke just above the rigid joint.

To overcome the disadvantages of this method of construction the Westinghouse Lamp Company, Bloomfield, N. J., decided that it would be necessary to obtain tungsten filaments in long lengths and to design an internal construction which would permit of the free movement of the tungsten filament so as to take up the shock and jar. These problems were finally solved and at the St. Louis convention of the National Electric Light Association, held in May, 1910, the Westinghouse Lamp Company showed samples of tungsten filaments up to 84 ft. in length. The company also showed lamps made from this filament in which the filament was wound, like wire from a spool, on the anchors of the spider, the ends of the filament were wrapped around the leading-in wires and the leading-in wires were fused to the ends of the filament. This construction leaves the filament free to vibrate in the anchors. At the same time the two joints with the leading-in wires are flexible because of the coil spring effect of the filament where it is wrapped around the leading-in wire.

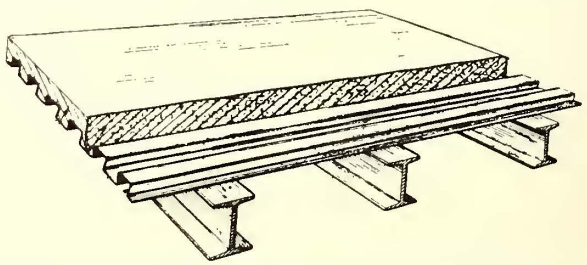
Numerous jar tests have shown these wire-type lamps to be radically stronger than the old fused-type lamp and that the life of the lamp is much longer than was the life of fused-type lamps. In some tests recently made at 1 watt per candle, average lives of as high as 400 and 500 hours have been obtained, and in tests at high efficiency voltage the average life has far exceeded the hours guaranteed.

The life of these lamps in train-lighting service on steam railroads and in industrial plants where they have been subject to shock and jar has proved very satisfactory and the Westinghouse Lamp Company is now prepared to recommend them for electric railway cars.

A SANITARY CAR FLOOR

A plastic material that will form an absolutely jointless, smooth and durable floor surface is the ideal flooring for passenger car construction. In all cars carrying a large number of people the floor should be one that can be kept clean with the least amount of work, that is not cold to the touch, that is fireproof and that has a surface good for resisting wear.

The American Monolith Company, Milwaukee, Wis., is manufacturing a flooring, under the name of "Monolith," which, when applied on a plain or corrugated sheet metal foundation, can be used in the construction of the entire car floor. It can be curved up against the side walls, forming a cove corner baseboard, or it can be formed in a tight joint around the lower construction of the seats. It can also be



Special Floor Composition Installed on Base of Corrugated Sheet Metal

formed into slabs as covers over the openings in the floor of the car, such as may be necessary to get at the machinery or motors.

This flooring has been widely used for passenger coaches, sleepers, dining cars, as well as mail and express cars, by many steam railroads. It is asserted that cars with this kind of flooring are almost free from vibration and that the deadening quality of the material takes up the noise of the trucks and the roadbed. As the material is plastic, it holds the entire floor construction rigid and firm. This flooring weighs only 55 lb. per square foot when applied on metal sheets to a thickness of ¾ in. at the weakest point. Its cost and installation are stated to be little higher than ordinary wooden construction.

News of Electric Railways

F. H. Goff on Changes in the Cleveland Ordinance

F. H. Goff, president of the Cleveland Trust Company, who was mediator for the Cleveland Electric Railway during the Goff-Johnson negotiations, expressed himself in part as follows in the Cleveland *Plain Dealer* on Feb. 10, 1911, in regard to the changes in the Tayler ordinance suggested by the officers of the company to aid them in financing present and future needs:

"There is no question in my mind but that the Cleveland Railway should be permitted to amortize any discount it may be compelled to make in selling its bonds. The injustice of requiring stockholders to bear the loss might be illustrated by supposing that the company was required to market $30,000,000 of bonds at 50. The discount would entirely wipe out the value of the stock.

"A dead level 6 per cent return to stockholders, regardless of whether service is good or bad or whether economy is practised, will not secure the results desired. It has always seemed to me that some provision should be made penalizing the stockholders by decreasing dividends if the property is inefficiently or indifferently managed and rewarding them by permitting an increase in the dividend rate if it is efficiently and economically managed.

"The crucial test is going to be whether the company can finance its requirements not only by sale of bonds but by sale of stock on satisfactory terms and whether as efficient management can be secured as would obtain under private ownership. If both results cannot be accomplished the plan will prove a failure.

"If the Cleveland Railway is permitted to sell either bonds or stock on a 6 per cent basis the annual charge on $15,000,000, which is perhaps the least amount required for immediate improvements and refinancing, would be $150.000 more than if the rate were 5 per cent.; $300,000 more than if the rate were 4 per cent. This excess during the life of the franchise would amount to $7,500,000, a loss which would have to be borne by the car riders either in the way of increased fare or poor service.

"The actual interest charge, as I understand it, at the price offered for bonds now proposed to be sold is in the neighborhood of 5¼ per cent, a reasonable offer, as it seems to me, under existing conditions, but if it is within the power of the city to enable the company to obtain funds in the future at a lower rate, it would seem the part of wisdom and prudence to consider whether such assistance ought not to be given. Of course, the city cannot lend its credit, but it can create such value in the grant as will afford unquestioned security to investors. I certainly would not favor amending the ordinance to increase the maximum rate of fare unless every precaution and safeguard are taken to make it impossible for the company ever to enjoy the higher rate for its own advantage.

"In the valuation of the Cleveland Railway's property, as determined by Judge Tayler, there was an allowance made of something like $3,800,000 for franchise value, which is represented by stock issued. The fact that the city has the right to purchase the property at the expiration of the grant without making compensation for this item has created a feeling of distrust in the stock as a safe investment, which is reflected in the market price.

"To enable the company to obtain funds by the sale of stock on satisfactory terms, I believe the form of this option will have to be changed, making the price to be paid the amount of capital value plus 10 per cent, which would put the option at the expiration of the grant on the same basis as that given during the life of the grant. So long as under any contingency the city can compel the sale of the property at a price which would yield less than 75 per cent of the par value of the stock, it will be difficult to interest investors at par or better, and any successful financing through sale of stock should contemplate, it seems to me, a sale from 110 to 115."

On Feb. 11 City Solicitor Baker rendered an option to the street railway committee of the City Council to the effect that amendments cannot be made to the Tayler grant without passing an entirely new grant. He further said that a new grant cannot be passed unless it contains provisions that would inure to the advantage of the city in terms positive enough to warrant the action taken. Mr. Baker said that the grant contains no provision for amortizing discounts on bonds and that the city cannot enter into an agreement with the company to guarantee amortization.

A report of street railway operation in Cleveland for the 10 months ended Dec. 31, 1910, was filed with the City Council on Feb. 6, 1911, by G. M. Dahl, street railway commissioner. His figures follow:

1901.	Surplus.	Deficit.
March	$18,880.94	.....
April	25,257.93	.....
May	26,355.29	.....
June	.....	$8,221.26
July	.....	7,769.76
August	.....	7,036.73
September	.....	8,466.70
October	11,111.30	.....
November	9,306 89	.....
December	20,257.96	.....
	$111,170.31	$31,494.45
Deficit	31,494.45	.....
Net surplus	$79,675.86	.....
Surplus in operating fund for six months	22,294.06	.....
Total surplus	$101.969.92	.....
Interest charges improperly deducted	9,740 00	.....
Grand total surplus	$111,709.92	.....

Right of Minneapolis to Order Railway Extensions

W. J. Hield, vice-president and general manager of the Twin City Rapid Transit Company, Minneapolis, Minn., has issued a statement in regard to the opinion filed with the city clerk by Judge Daniel Fish, city attorney of Minneapolis, who held that the city had power to order and enforce construction of new lines and extensions and to regulate service by the Minneapolis Street Railway. The opinion was referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 4, 1911, page 236. Besides dealing with the opinion of Judge Fish Mr. Hield outlined some of the important work which the company has in contemplation in Minneapolis and St. Paul. Mr. Hield's statement follows:

"The opinion of the city attorney was submitted to the Council at its regular meeting on Jan. 27, 1911. At an adjourned meeting of the Council on the following day six resolutions were introduced calling for the construction of new lines or extensions. Some of these were repetitions of orders already passed by the Council, while others called for lines not previously mentioned. All these resolutions were referred in the regular way to a committee made up of one alderman from each ward, where they now rest pending further discussion of the subject with the city attorney. Whether other and similar resolutions will be introduced before further action is taken on those above mentioned is a question concerning which I have no knowledge.

"As the opinion of Judge Fish was not made public until after our annual meeting, it was not a subject for discussion, and I am therefore not in position to make any statement as to the attitude of our company until the resolutions now before the committee of the Council have been acted upon and the whole matter brought before our board of directors.

"The company's plans which have thus far been approved, covering improvements for the current year, include the completion of work begun last year on the installation of a 14,000-kw turbine unit and auxiliary apparatus. Additional boiler capacity will also be installed. The construction of improved smoke consuming furnaces and stoking devices, which was interrupted last year on account of shortage of water power, will be completed during the summer. When this work is finished the entire boiler plant will be provided with the most thoroughly modern boiler furnace construction and stoking equipment.

"These improvements will not only make impossible a recurrence of the troubles which existed during the greater part of last year as a result of the unprecedented water shortage (a situation which was further aggravated by a se-

ries of accidents to power generating apparatus), but should also render the steam plant practically smokeless in operation. In order to improve power conditions in general throughout the system, the construction of two additional substations will be undertaken, as well as the installation of a large amount of underground and overhead copper incident to the building of the substations and in order to provide for increased load and the maintenance of a suitable reserve capacity in transmission lines.

"The improvements in track and roadway to be undertaken this year include the reconstruction of considerable existing track and paving, in addition to a large amount of new work which must be done in order to keep pace with the paving which the city will order during the year. For a number of years past annual expenditures of more than $1,000,000 have gone into improvements such as those outlined."

B. S. Josselyn on Public Service Commissions

The Portland *Carman* for January, 1911, which is issued monthly for the Brotherhood of Electric Employees of the Portland Railway, Light & Power Company, Portland, Ore., contains an expression of opinion by B. S. Josselyn, president of the company, in which Mr. Josselyn says that the editorial "Merit as a Requirement for Commission Service," published in the Electric Railway Journal of Dec. 3, 1910, page 1090, expresses his ideas so fully that "I can add very little thereto, except to reiterate that public utility concerns have problems to meet that cannot readily be understood by a layman and it would greatly facilitate the work of both commission and public utilities if these matters were handled by reliable experts, rather than by those who have no practical experience in the matters they strive to regulate."

Mr. Josselyn says in part:

"I am not opposed to the institution of a commission that will have for its purpose a better understanding between public utility concerns and the public. In fact, such a commission is desirable in order that complaints may be lodged in the hands of people who are qualified to investigate and apply proper remedies for improvement, or who are able to explain to the public why some conditions complained of cannot be overcome—a course in which the general public would have more confidence than is usually expressed in public utility concerns.

"The main cause for friction between public service commissions and corporations which they strive to regulate is the fact that in many instances so-called experts selected by commissions to assist them in their work are men who have not proved themselves capable.

"Properly managed public utility concerns have nothing whatever to conceal from the general public. Their business cannot be successful unless the public is properly and satisfactorily served; but just what constitutes these requisites is a subject for debate; and the public should select men to represent it in these considerations who are qualified to handle intelligently the questions arising. Then both the public and the public utility concerns would be served to the utmost.

"I have no criticism to make as to the selection of our present Railroad Commission, which I believe has performed excellent service for the public."

Mr. Josselyn incorporated in his article the editorial "Merit as a Requirement for Commission Service" substantially as it appeared in the Electric Railway Journal.

Development of Interurban Railways Near San Francisco

Indications point to an extensive development of electric railways in the central part of California near and tributary to San Francisco. The Oakland & Antioch Railway will soon begin to operate its road from Bay Point to Walnut Creek, while work is being carried on to complete the road into Oakland. The Northern Electric Railway is operating from Sacramento north, the Central California Traction Company has established service between Sacramento and Stockton, several lines are projected at and near Stockton, Fresno and Merced, the United Properties Company has announced as a part of its plan the extension of the Oakland lines to San José and Sacramento, and the Ocean Shore Railroad, now that it has been sold to the bondholders and been taken out of the receivers' hands, will be completed between San Francisco and Santa Cruz.

Great interest is being taken in a project to build a tunnel under San Francisco Bay so as to connect the transportation systems of Alameda County with San Francisco. It is known that a thorough investigation of the engineering problems involved in the construction of such a tunnel was made for the Southern Pacific Company before that company authorized the construction of the Dumbarton bridge. It was determined at that time that the present traffic did not warrant the expenditure, and the depth of the bay between Goat Island and the San Francisco shore presented a difficulty in the matter of grades. A more recent plan is to construct the tube from a point on the Oakland shore to the vicinity of Islais Creek on the San Francisco side, thus obviating the grades that were involved in the shorter route. It has also been pointed out that the properties of the Ocean Shore Railroad Company would furnish an admirable terminal on the San Francisco side of the bay, thus landing Alameda County passengers in the center of San Francisco, at the corner of Twelfth Street and Market Street.

A San Francisco engineer, L. R. Jorgensen, has estimated the cost of a tunnel from the Key Route pier of the San Francisco, Oakland & San José Railway, on the Oakland side of the bay, to San Francisco, coming to the surface at Kearney and Market Streets and traversing Goat Island in its course. For such a single tube, 23 ft. in outside diameter, and having a total length under water of 16,500 ft. and 7000 ft. under Goat Island and Market Street, he estimates that $10,576,000 would be required, and twice that amount for a double tube. Adding $1,000,000 for terminal property, the entire cost would be $23,392,000, which at 6 per cent and 1 per cent for depreciation would result in a fixed charge of $470 per day. This charge, he finds, would be greater than the traffic of any single railroad could bear, but he thinks that if all the roads were to unite in bearing the capital expense the project might be feasible at the present time.

New conditions have arisen, and in particular the prophesied effect of the Panama-Pacific Exposition in increasing the population on both sides of the bay, and it is not unlikely that eventually the Ocean Shore Railroad and a new line down the peninsula will be a part of the system which is now in process of formation.

Meeting of New York Association.—It has been decided to hold the next quarterly meeting of the Street Railway Association of the State of New York at the Hotel Onondaga, Syracuse, N. Y., on Tuesday and Wednesday, March 21 and 22, 1911.

Meeting of New England Street Railway Club.—The regular monthly meeting of the New England Street Railway Club will be held at the American House, Boston, Mass., on the evening of Feb. 23, 1911. Dinner will be served at 6:45 p. m. At 8 o'clock the regular business meeting will be held, after which Henry Gulick, president of the Gulick-Henderson Company, inspecting engineers, Pittsburgh, Pa., will address the club on "Inspection of Electric Railway Material and Equipment."

Honorary Degrees by University of Nebraska.—On the evening of Jan. 18, 1911, the University of Nebraska awarded the degree of doctor of engineering to Dean M. C. Cooley of the University of Michigan and J. A. L. Waddell, Kansas City, in recognition of the services which they have rendered to the engineering profession. The degree of doctor of engineering has also been conferred by the same university on Bion J. Arnold, Chicago, Ill., as noted in the Electric Railway Journal of Jan. 28, 1911, page 168.

Charter Revision in Detroit.—It is believed that the Common Council of Detroit, Mich., will soon take action toward placing before the voters at the April election the question of revising the charter in order that the home rule, municipal ownership and other amendments may be made to it. Mayor Thompson and Corporation Counsel Hally favor asking the Legislature to amend the law governing this matter, so that the city may have the advantage of the municipal ownership feature sooner than would be possible if the charter is submitted for revision.

Development of Montauk Point.—Ralph Peters, president of the Long Island Railroad, has announced that the company has signed a contract for the purchase of 160 acres of water front on Fort Pond Bay, on the north side of Montauk Point, at the end of Long Island. The company for some time has held 60 acres of the water front land at that point and Mr. Peters states that the additional holdings are to be acquired to provide terminal and docking facilities in case it becomes necessary for the ocean liners to dock at Montauk instead of New York.

C. V. Weston on Public Service Commissions.—A short paper entitled "The Public and the Public Service Corporation" was presented at the meeting of the Western Society of Engineers held in Chicago, Ill., on Feb. 1, 1911. C. V. Weston, president and general manager of the South Side Elevated Railroad, Chicago, Ill., favored "supervision" by commission, but not "administration" by commission. He referred to the powers of the commissions in New York State as excessive. He thought the Massachusetts method better. Proper regulation should secure the integrity of the investment. He thinks that the time is rapidly approaching for a change in the method of administering the public service business in Chicago.

Public Service Property in the Mexican Danger Zone.—Stone & Webster, Boston, Mass., control the El Paso Electric Railway and the El Paso Electric Company, which operate in El Paso, Tex., and Juarez, Mex., territory within the zone in which the insurrectos under Orozco and the federal cavalry of Mexico are skirmishing. The Boston *Herald* said recently: "Messages received from H. S. Potter, of Stone & Potter, said that little anxiety was felt because of the presence of the rebels. The rebel leader had sent word, both to the American consul at Juarez and the Mayor of El Paso, that American property would not be damaged in the least. The messages said that, in spite of the expected assault upon the city, the street car traffic both ways between El Paso and Juarez was normal. This was taken to indicate little popular unrest. The car houses and power house are all on the American side of the river, and the property on Mexican soil is only trackage and trolley poles."

Labor Compensation Bill.—The Executive Council of the National Civic Federation, to which was referred at the annual meeting of the Federation in New York in January, 1911, the questions of a proposed compensation bill for workmen injured by industrial accidents, which had been prepared, and amendments proposed by President Seth Low to the labor law of New York State, met in New York on Feb. 4, 1911, and took up these questions. One of the measures proposed was an amendment to the present laws to be suggested to the different States by which whenever a strike or lockout has occurred or is threatened involving public service corporations, either side of the dispute or any 10 citizens may ask the Governor of the State to appoint a board of mediation, and, if need be, of arbitration, if acceptable to both sides, to try to prevent the interruption of traffic by the adjustment of all questions in dispute. Another proposal is to give to the boards of mediation of each State authority to confer with similar boards in other States in order that groups of States having a common interest, such as the States bordering on the Great Lakes, may be able to co-operate in adjusting an interstate dispute. Mr. Low was authorized by the Executive Council to prepare a bill for uniform State legislation on these lines and a draft of the bill is now ready. The bill aims to concentrate public attention upon the non-interruption of service due to the public in connection with the public service utility, and it was stated also that it proposes to trust public opinion with the adjustment of all controversies of this kind. Details of this plan were drawn up at the meeting on Feb. 4. The amendments to several sections of the labor law proposed by Mr. Low at the annual meeting and referred to the council were discussed. If the bill becomes law workmen would be assured of compensation for industrial accidents which were not caused by negligence on their part without the expense and uncertainty of lawsuits.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Alabama.—Representative Long introduced at the session of the House on Feb. 7 a bill to enlarge the powers of the Railroad Commission so as to give that body jurisdiction over all public utilities. The measure would provide two additional members of the commission, or for a commission of five members, to be appointed by the Governor at a salary to be fixed. The bill has been referred to the committee on commerce and common carriers.

California.—The bill introduced by Senator Burnett to amend Section 499 of the California Civil Code has been passed by the Senate. The bill relates to the use of the same street or tracks by two street railways so as to afford San Francisco freedom from the present five-block restriction in laying out its municipal railroad. The purpose of a bill which Senator Haus has introduced is to enable the Alameda County Board of Supervisors to construct a tunnel or subway under the estuary dividing Alameda and Oakland. Its provisions are broad enough, however, to permit tunneling between two counties. This would make possible the tunneling of San Francisco Bay between Oakland and San Francisco via Goat Island, or otherwise. This scheme has been proposed from time to time, but abandoned because of restrictions contained in the present laws. The consent of such municipalities as are affected is necessary. Two or more counties may share the cost. Several measures have been introduced toward conservation of the State's resources. Two of these provide for the creation of boards of control to govern appropriations of water for electric and power purposes. The Railroad Commission bill has been passed by the Assembly. The important feature of the Bohnet-Stetson bill compared with the Wright act, under which the Railroad Commission is now operating, is that $100,000 is appropriated to carry out an investigation into the physical valuation of railroads operating within this State, to obtain figures upon which to base freight and passenger rates.

Connecticut.—The second hearing on bills introduced into the Legislature to create a public utility commission was held before the judiciary committee on Feb. 8. E. C. Terry, New Haven, appeared in behalf of employees of the railroads in opposition to the public utility measure. F. F. Lendewig Plainfield, criticised the commerce court suggested by Mr. Mellen, president of the New York, New Haven & Hartford Railroad. B. H. Douglas, New Haven, who represented the United Commercial Travelers' Association, urged particularly a provision to compel the railroads so to adjust their schedules that better time would be made in making connections between trains. Speakers were also in attendance representing the business men of Bridgeport, South Norwalk, Norwich and other cities. At the close of the hearing it was announced that on Feb. 21 Mr. Mellen would be heard in behalf of the court of commerce bill which he advocates, and that those who object to a utilities bill will also be heard at that time.

Iowa.—Senator Sammis has introduced a bill to establish a public service commission for the regulation and control of public utilities, assuming the powers and duties of the executive council as prescribed by the General Assembly so far as they relate to public service corporations; also the powers and duties of the Railroad Commission. The commission would consist of five members, to receive $5,000 a year each. The new law would go into effect on July 1, 1911. It seems likely that the Sammis-Crist public utility bill in amended form will pass. The measure was referred to the committee on judiciary of the House, which in turn through its chairman recommended that the bill should be referred to the committee on railroads. This was done. The chairman of the committee on railroads conferred with the chairman of the committee on municipal corporations and arrangements have been made for a joint meeting of these committees. Following the joint hearing there will be separate hearings.

Massachusetts.—Among the bills relating to transportation matters which have been introduced are the following: A bill to provide for the extension of the Washington Street tunnel to the vicinity of Dudley Street; a bill to extend the term of office of the Boston Transit Commission three years; a bill to construct a subway from the South Station to South Boston and Dorchester; a bill to provide that all extensions of steam and street railway lines hereafter shall be double tracked; a bill to require street railways to provide suitable waiting rooms for passengers; a bill to require street railways to

provide special service for working men and women between the hours of 5 a. m. and 8 a. m. and 5 p. m. and 7 p. m., with the permissive requirement of special rates for such service; a bill on behalf of street railways in connection with the issue of preferred stock, to the effect that such stock may be issued upon a two-thirds vote of all the outstanding stock at a special meeting called for the purpose in substitution for outstanding common stock under conditions approved by the Railroad Commission; a bill to place the ventilation of street railway, subway and elevated cars in the hands of the district police; a bill to reduce the hours of labor of street and elevated railway employees; a bill to repeal the act which provides for the construction of an east and west tunnel and subway in Boston; a bill to provide for the construction of a subway from the Charlesgate District of Boston under Boylston Street to the South Station, with an extension of the Boston terminus of the Cambridge subway from Park Street to Park Square, with the object of providing for underground transit in the business section of the Back Bay and to establish a new center of distribution for incoming traffic: and another bill to provide for the construction of a subway from the Charlesgate District under Boylston Street and Boston Common to Park Street.

Despite the unfavorable report of the Massachusetts Railroad and Boston Transit Commissions regarding the construction of a loop subway in the West End of Boston, the Codman interests have introduced a bill to this end in the present session. A bill has been filed in the House which authorizes the Boston & Northern Street Railway to acquire the franchise and property of the Old Colony Street Railway. Another bill provides that a street railway shall not employ a motorman unless he has been examined within a year to determine whether it is safe for him to perform the duties of the position. The Massachusetts Street Railway Association has petitioned the Legislature to amend the existing law respecting crossings at grade of steam and street railways, to the effect that the Railroad Commission may, in its judgment, permit crossing of a street railway with a railroad built for industrial purposes only. A bill has been filed in the House to require street railways to accept as legal fare transfers issued by them at any hour of the day on which they are issued. A bill introduced into the House provides that pole and wire locations may be granted by municipal authorities, no approval of the Railroad Commission being specified in the proposed act. A bill is now before the House which provides that all street railway cars using headlights of high candlepower shall be equipped with a device to turn the light automatically on curves so as to confine the rays to the center of the track. Another House bill provides that conductors and motormen shall have one day off in 15. A bill attacking the fare-adjudicating authority of the Railroad Commission provides that the fare charged by the Old Colony Street Railway in Weymouth shall not exceed that charged by the company for a like distance in Braintree and that transfers shall be given to a like extent. An attempt is being made to secure the passage of a law by which municipal authorities would be permitted to grant limited franchises to street railways for the carriage of baggage and express matter.

The joint special committee of the Legislature gave a hearing on Feb. 9 on the five public utility measures which have been introduced and on the recommendations in regard to public utility legislation which were contained in the message of Governor Foss. The principal measure to receive attention was House bill 1378. This measure is based on the lines of the law creating the Public Service Commissions of New York. Travis H. Whitney, secretary of the Public Service Commission of the First District of New York, was the principal speaker. He was interrogated at length with regard to the workings of the commissions in New York. Mayor Fitzgerald thought that the bill drafted in accordance with the ideas of Governor Foss as expressed in his message was too comprehensive. He expressed the opinion that the metropolitan district of Boston should constitute a separate district from the rest of the State and that a commission should be created for Boston. The joint report to the Senate by the Railroad Commission and the Boston Transit Commission was referred to in the Electric Railway Journal of Feb. 11, 1911, page 279.

New Jersey.—Senator Osborne's bill to provide for the creation of a new Board of Public Utility Commissioners has been referred to the judiciary committee. Should the measure become a law it would legislate out of office the present utility board, composed of Republicans. It would also mean that the new board might be made up of Democrats and it is not regarded as possible that the Republican majority in the Senate will lend their aid to the enactment of a measure which might deprive the party of such patronage. Under the present utility law it will be impossible for the control of the board to pass out of the hands of the Republicans until May 1, 1913. Even then the Republicans will have one member on the board, assuming, of course, that Governor Wilson appoints Democrats in the places of the Republicans whose terms will expire during his three years as chief executive of the State. The term of Frank H. Sommer, president of the board, will expire on May 1, 1911, while that of Robert H. Williams will expire on May 1, 1913. The term of Thomas Hillery will not expire until 1915. The Osborne bill carries with it rate making power, and while a measure with such provisions will probably be passed at the present session it seems certain that the Osborne measure is doomed to be defeated. Feb. 12 marked the sixth week of the Legislature. Owing to the holiday on Lincoln Day the usual session on Monday night was omitted. Hearings were set for Feb. 14 on public utility legislation and on the pending employers' liability legislation.

New York.—Senator Grady introduced a bill on Feb. 11 which provides that in New York City no contract for building or operating a rapid transit railroad built wholly or in part by public funds shall be awarded to any person or corporation at present operating such a railroad without the unanimous consent of the Board of Estimate. In other cities the same unanimous consent must be obtained from the board or "analogous local authority." The employers' liability commission, of which Senator Wainwright is chairman, held a hearing on Feb. 10 on the causes and prevention of industrial accidents. Very few persons attended the hearing, and Chairman Wainwright was quoted as saying it was amazing, in view of the importance of this matter and the nature of the legislation that might be enacted, that those most directly concerned showed such a lack of interest. A bill has been introduced to amend the Public Service Commission Law so as to eliminate street railways from the prohibitive clause which relates to the issuance of free passes. A radical measure has been introduced in regard to the laws governing the relations between capital and labor. One of the provisions of this measure would make it an offense not to state in a help wanted advertisement that there was trouble between employer and employees, if such condition actually existed. Under this measure it would be a crime to hire or aid in hiring persons to guard with deadly weapons other persons' property, and persons coming from other cities so armed for that purpose without the consent of the Governor would be deemed guilty of felony.

Pennsylvania.—Only one bill of interest to electric railways has thus far passed either branch. That is the measure to authorize the Valley Forge Park Commissioners to enter into agreements with railways and railroads and to regulate travel through the Park, which was passed finally in the Senate and sent to the House. Mr. Feeny has introduced a bill in the House to impose a penalty of $500 fine and one year in jail upon the officers of any electric railway operating two-car trains without having air brake or other equipment so that the brakes of the rear car may be operated by the motorman of the leading car. Representative Hoover introduced a bill requiring railroads to maintain safety devices, gates and gongs at all grade crossings. Representative Mills has introduced a bill to grant the right of eminent domain to electric light, heat and power companies, also a companion bill to allow such companies to build a line midway to any stream forming a boundary between Pennsylvania and an adjoining State. This bill is similar to the eminent domain bill introduced in the session of 1907 in the interest of the McCall's Ferry Power Company. If it becomes a law it will give the McCall's Ferry Company the right to string wires and cables through every municipality within a radius of 200 miles of the company's plant, recently completed.

Financial and Corporate

New York Stock and Money Market

Feb. 14, 1911.

The Wall Street market is still marking time. After several weeks of advance there has come a pause—not a reaction. It is not likely there will be any pronounced change until after the trust and rates cases are decided and it is hardly to be hoped that before that time the outside public will become interested.

There is still an excellent demand for good bonds and the money market is very easy. Rates to-day were: Call, 2¼@2½ per cent; 90 days, 3¼@3½ per cent.

Other Markets

There was a trifle more activity last week in traction shares in the Philadelphia market, although transactions were at no time heavy. Prices were in no wise improved by the increased activity and for both Rapid Transit and Union Traction were a trifle lower at the close to-day than they were one week ago.

In the Chicago market there has been very little doing during the week in traction shares. Beyond a few scattered sales of Series 2 and 3 of the Chicago Railways Company tractions have been ignored. Prices have not improved.

In Boston Massachusetts Electric and Boston Elevated have both continued to appear in small lots almost daily, but there has been no definite tendency to the trading. Prices are a trifle easier.

Some fair-sized blocks of United Railways stock have been sold in the Baltimore market during the past week, the price for the most part being in the neighborhood of 17½. The bonds have also maintained their usual activity.

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

	Feb. 7	Feb. 14
American Light & Traction Company (common)	a288	a290
American Light & Traction Company (preferred)	a105	a106
American Railways Company	a45	44¾
Aurora, Elgin & Chicago Railroad (common)	a44½	44½
Aurora, Elgin & Chicago Railroad (preferred)	a85	85
Boston Elevated Railway	a128	a129
Boston Suburban Electric Companies (common)	a16	a16
Boston Suburban Electric Companies (preferred)	a71½	a71½
Boston & Worcester Electric Companies (common)	a9	a9
Boston & Worcester Electric Companies (preferred)	40	40½
Brooklyn Rapid Transit	78¾	78¾
Brooklyn Rapid Transit Company, 1st ref. conv. 4s	84⅛	84
Capital Traction Company, Washington	129⅞	129¼
Chicago City Railway	a200	*200
Chicago & Oak Park Elevated Railroad (common)	*3¼	*3¼
Chicago & Oak Park Elevated Railroad (preferred)	*7¼	*7¼
Chicago Railways, ptcptg., ctf. 1	a93	93
Chicago Railways, ptcptg., ctf. 2	a25¼	25¼
Chicago Railways, ptcptg., ctf. 3	a9½	9½
Chicago Railways, ptcptg., ctf. 4	a6¼	6¼
Cleveland Railway	*91½	*91½
Consolidated Traction of New Jersey	a75½	a76
Consolidated Traction of N. J., 5 per cent bonds	a105	a105
Detroit United Railway	72	72
General Electric Company	a154	a155¼
Georgia Railway & Electric Company (common)	a123	a126
Georgia Railway & Electric Company (preferred)	a88	a88
Interborough-Mctropolitan Company (common)	19½	20¼
Interborough-Metropolitan Company (preferred)	a53¾	a54¼
Interborough-Metropolitan Company (4½s)	78⅞	79
Kansas City Railway & Light Company (common)	22	22
Kansas City Railway & Light Company (preferred)	71	71
Manhattan Railway	*137¾	*137¾
Massachusetts Electric Company (common)	a18½	a18
Massachusetts Electric Companies (preferred)	a88	a88
Metropolitan West Side, Chicago (common)	21	a20¾
Metropolitan West Side, Chicago (preferred)	67	67
Metropolitan Street Railway, New York	*19½	*19½
Milwaukee Electric Railway & Light (preferred)	*110	*110
North American Company	71½	72
Northwestern Elevated Railroad (common)	a22½	a22
Northwestern Elevated Railroad (preferred)	*63	a62
Philadelphia Company, Pittsburgh (common)	53	52⅞
Philadelphia Company, Pittsburgh (preferred)	44½	42¾
Philadelphia Rapid Transit Company	20½	a19⅞
Philadelphia Traction Company	*86½	a85
Public Service Corporation, 5 per cent col. notes	a96½	a96½
Public Service Corporation, ctfs.	*103½	105½
Seattle Electric Company (common)	a110½	a111½
Seattle Electric Company (preferred)	a101½	a100½
South Side Elevated Railroad (Chicago)	a70	a72
Third Avenue Railroad, New York	11	*11
Toledo Railways & Light Company	8	8
Twin City Rapid Transit, Minneapolis (common)	a110¾	110¾
Union Traction Company, Philadelphia	a47¾	a47½
United Rys. & Electric Company, Baltimore	a18	18
United Rys. Inv. Co. (common)	47¾	46
United Rys. Inv. Co. (preferred)	71¾	74
Washington Ry. & Electric Company (common)	a36	a36
Washington Ry. & Electric Company (preferred)	a89	a88¾
West End Street Railway, Boston (common)	a92½	a92
West End Street Railway, Boston (preferred)	*105	102½
Westinghouse Elec. & Mfg. Co.	69	a71
Westinghouse Elec. & Mfg. Company (1st pref.)	*119	a120

a Asked. * Last sale.

Annual Report of the United Railways of St. Louis

The annual report of the United Railways Company of St. Louis for the year ended Dec. 31, 1910, shows the following results:

Revenue from transportation:		
Passenger revenue	$11,373,465	
Special cars	13,724	
Mail	47,452	
Express	12,466	
Miscellaneous transportation	671	
Total		$11,447,778
Revenue from operation other than transportation:		
Car privileges (advertising)	$54,000	
Rent of tracks and terminals	2,980	
Rent of buildings and other property	3,840	
Sale of power	25,739	
Miscellaneous	3,437	
		89,996
Total operating revenue		$11,537,774
Operating expenses and depreciation:		
Operating expenses	$6,096,794	
Depreciation	1,153,777	
		7,250,571
Surplus over operating expenses and depreciation		$4,287,203
Taxes		655,531
Net income from operation		$3,631,671
Income from other sources:		
Income from securities owned	$36,554	
Interest on deposits	3,671	
Miscellaneous	2,842	
		43,067
Gross income (less operating expenses, depreciation and taxes)		$3,674,738
Deductions from income:		
*Interest on funded debt (in hands of public)	$2,726,726	
Interest on notes payable	67,017	
		2,793,743
Net income		$880,995
*Dividend on preferred stock in hands of public (April and July)		409,580
Surplus		$471,415

*Does not include any amount for interest or dividends on bonds and stock of the company's own issue held in the treasury, whereas figures shown in last annual report did include such items as both a debit and a credit.

President Robert McCulloch says in his report in part:

"The passenger revenue for 1910 was $11,373,465, an increase over 1909 of $467,320. Other revenue from transportation increased $4,011. Revenue other than transportation decreased $2,457, and income from other sources increased $535. The gross earnings and other income for 1910 were $11,580,841, an increase of $469,410 over 1909.

"Operating expenses, depreciation and taxes increased during the year $877,924. After payment of the dividend on preferred stock in hands of the public for the six months ended June 30, 1910, the surplus earnings for the year 1910 were $471,415.

"The total number of revenue passengers carried during the year were 230,691,532; transfer passengers, 104,904,281, making the total number of revenue and transfer passengers 335,595,813, an increase of 14,840,732 over 1909.

"By contract with the Mississippi Valley Trust Company and Francis Brothers & Company, the 5 per cent bonds of the St. Louis Railroad maturing on May 1, 1910, amounting to $1,948,000, were extended to May 1, 1920, with interest at the rate of 4½ per cent, thereby reducing the fixed charges $9,740 per annum.

"During 1910 the amount paid out for personal injuries, property damages and other expenses connected with the claim department increased $23,309 as compared with the year 1909. The sum of $271,565 was transferred from this reserve account to the credit of profit and loss, leaving a balance to the credit of the injuries and damages reserve on Dec. 31, 1910, of $700,000.

"During the year the fire insurance reserve was increased in the sum of $35,384, making the amount to the credit of this account on Dec. 31, 1910, $261,935.

"The charge to operating expenses for depreciation during the year was 10 per cent of the gross earnings, experience having shown this proportion of the gross earnings is required to provide for the present annual depreciation of the property.

"During the year we expended and charged to depreciation reserve the sum of $970,041, leaving to the credit of depreciation reserve on Dec. 31, 1910, the sum of $338,064.

"On Sept. 13, 1910, the board of directors, impelled by

their duty in caring for the interest of the stockholders of the company, suspended the payment of dividends. Improvements, betterments and additions to the physical property of the company had necessitated borrowing from banks and trust companies in St. Louis the sum of $1,300,000, and as further improvements, betterments, etc., were necessary and demanded it was deemed wise, prudent and for the best interest of the stockholders to pay off this indebtedness and accumulate a fund for future improvements, betterments and additions, before any further dividends were paid. The notes payable on Dec. 31, 1910, not including $55,000 real estate note due March 4, 1915, were $1,050,000, showing a reduction of $250,000 since Sept. 13, 1910.

"During the year there was expended and charged to capital account, for new construction, betterments and improvements, the sum of $325,792, as follows: Real estate, buildings, tools and fixtures, $98,593; track and roadway construction, $150,281; electric line construction, $28,342; power plant buildings and equipment, $50,027; miscellaneous equipment, $293; total, $327,536; less cars and electric equipment of cars sold, $1,744; total, $325,792.

"During the year a new survey was made of all the track of this company. The mileage on Dec. 31, 1910, was as follows: City track, 347 miles; county track, 108.81 miles; total track on streets and private right-of-way, 455.81 miles. During the year 4.13 miles of track were added and 1.66 miles of dead track removed. During the year there were rebuilt 28.99 miles and resurfaced 12.22 miles of track. During the year 23.63 miles of T-rail track on the county lines were retied and reballasted, putting this track in thoroughly good condition. To the paved track there were added during the year 15.71 miles. The character of the roadbed of the 347 miles of city track, of which 19.21 miles are laid in private right-of-way, is as follows: Granite block pavement, 164.74 miles; brick pavement, 92.33 miles; creosoted wooden block, 6.46 miles; asphalt, 7.49 miles; macadam pavement, 57.18 miles; macadam ballast, no paving, 16.24 miles; plank on bridges, 0.07 mile; creosoted wooden blocks on bridges, 2.03 miles; trestles, 0.46 mile; total city track, 347 miles.

"Since 1904 the amount of reconstruction, renewal and extensions of track by the company in the city and county was as follows: During 1904, 21.56 miles; during 1905, 8.90 miles; during 1906, 29.18 miles; during 1907, 21.65 miles; during 1908, 32.99 miles; during 1909, 39.93 miles; during 1910, 45.34 miles; total for seven years, 199.55 miles. These figures include work done on the track of the St. Louis & Suburban Railway since Jan. 1, 1907. With the new work done during the past few years the physical condition of the track was constantly improved, but in order to keep it in good operating condition it will be necessary to rebuild between 20 miles and 25 miles of the old track each year.

"During the year, besides the necessary maintenance of bridges and buildings, there was completed the following work among various improvements:

"The erection of a brick terminal station at the Wellston loop, which is the junction of two downtown lines, one crosstown and three suburban lines. This station contains a waiting room for passengers, toilets, a store and a division office.

"The building of a car storage yard at Kossuth and Obear Avenues on property belonging to the company. This yard contains 5140 ft. of straight track and storage space for 109 cars. The old building on this property was repaired to serve as a division office. It is expected that considerable saving will be effected in the use of this car storage yard on account of the dead mileage eliminated.

"The erection of a sand drying plant on the terminal railroad tracks. During the spring of 1910 the old sand drying plant was destroyed by fire. At certain seasons of the year there is used as much as two carloads of dry sand per day, and as the old plant was poorly located and required an excessive amount of labor in its operation it was decided to build a new sand drying plant on property owned by the company adjacent to the terminal railroad tracks which should be fireproof and automatic in operation. It is expected that the saving in freight charges and labor will entirely pay for this plant in a few years.

"The power stations were thoroughly maintained and are all in first-class operating condition. During the year 1910 the power plants of the United Railways Company of St. Louis were operated at a maximum capacity of 44,600 hp, and 21,400 hp were supplied by the Union Electric Light & Power Company, making a total capacity of 66,000 hp required for the operation of the road. The kw-hours furnished during the year were as follows: Kw-hours from United Railways plants, 98,970,715; kw-hours from Union Electric plants, 62,178,573; total, 161,149,288. There were burned in the plants of the United Railways Company of St. Louis 313,412 tons of coal.

"In addition to the regular maintenance work there were built in the shops of the United Railways Company of St. Louis 25 steel fireproof cars of the most modern design. Fifty-six cars were overhauled, repainted and changed to the pay-as-you-enter plan. Six automobile tower wagons were built in the shops of the United Railways Company of St. Louis and are now in service. All of the emergency calls are now answered by automobiles."

Earnings of Public Service Railway

The Public Service Corporation of New Jersey, Newark, N. J., has reported the earnings of the Public Service Railway to the New York Stock Exchange for the year ended Dec. 31, 1910, as follows:

Gross earnings	$12,822,621
Operating expenses	7,687,191
Net earnings	$5,135,430
Fixed charges	4,305,757
Combined surplus of Public Service Railway and subsidiary companies for twelve months ended Dec. 31, 1910	$829,673
Less surplus of subsidiary companies not declared in dividends and not taken up in accounts of Public Service Railway	23,002
Total	$806,671
Less dividend paid during year (2 per cent Dec. 31, 1910)	754,326
Total	$52,345
Amount to credit of profit and loss Dec. 31, 1909	3,890
Balance to credit of profit and loss Dec. 31, 1910	$56,235

The statement of the company to the Stock Exchange contains the following information in regard to the terms on which the property of the New Jersey & Hudson River Railway & Ferry Company was taken over:

"On Oct. 1, 1910, the Public Service Corporation purchased 24,447½ shares (par value of shares $100 each) of a total of 25,000 shares of common stock outstanding of the New Jersey & Hudson River Railway & Ferry Company. There is also outstanding $742,800 par value preferred stock of an authorized issue of $750,000. The New Jersey & Hudson River Railway & Ferry Company stock was purchased under an agreement dated July 1, which provided for the payment for each share of $108 in Public Service Corporation of New Jersey 5 per cent general mortgage bonds and $12 in cash, with interest at 5 per cent from July 1 to Oct. 1. All the shares purchased, except nine standing in the names of directors, have been deposited with the trustee subject to the Public Service Corporation general mortgage."

Report of The J. G. Brill Company

On Feb. 8, 1911, James Rawle, president of The J. G. Brill Company, Philadelphia, Pa., presented his annual report to the stockholders of that company. An abstract of the report follows:

"The output from the five plants owned and operated by The J. G. Brill Company for the 12 months ended Dec. 31, 1910, amounted to $5,960,778.61. For comparison the amounts of the combined sales of the five companies for the four years last past are here given: 1907, $9,211,825.72; 1908, $3,845,173.91; 1909, $4,261,204.90; 1910, $5,960,778.61.

"After charging to repairs to buildings, machinery and tools the sum of $161,083.20, the profit on the output for 1910 amounted to $440,955.78, from which has been set aside for depreciation $114,623.78, leaving a net profit for the year of $326,332. At a directors' meeting held Jan. 27, 1911, the regular quarterly dividend on the preferred stock at the rate of 7 per cent per annum, amounting to $80,150, was declared, and was paid Feb. 1, 1911.

"During the year the well-established policy of keeping up your properties in good physical condition was fully maintained. I have indicated to you above the large sum expended for this purpose and charged to operating ex-

penses. In this connection you will note the conservative amount set aside during the year into reserve for depreciation.

"While the output increased over the years 1908 and 1909 the depreciation of these years, especially 1909, was reflected in the output of the first part of 1910. Though business was then beginning to return to a somewhat normal condition, much of the work turned out early in the year represented contracts taken under strong competition in the latter part of 1909. The output for the latter part of the year showed an improvement, and the work now on hand has been taken on a satisfactory basis.

"I need only call your attention in passing to the excellent financial condition of your company, as indicated by the statements submitted to you herewith. On Dec. 31, 1910, your combined companies had orders in process of completion amounting to $2,046,218, with a much improved outlook for profitable work. I submit the following condensed balance sheet as of Dec. 31, 1910, and also a condensed statement of the sales and expenditures for the year 1910."

THE J. G. BRILL COMPANY AND SUBSIDIARY COMPANIES.
COMBINED BALANCE SHEET, DEC. 31, 1910.

ASSETS.

Cost of properties	$8,353,684
Materials, raw and in process	1,492,485
Bills and accounts receivable	2,009,096
Investments	305,828
Cash	343,027
	$12,504,120

LIABILITIES.

Preferred stock	$4,580,000
Common stock	5,000,000
Bonds (John Stephenson Company)	400,000
Bills and accounts payable	1,496,180
Surplus of Wason Mfg. Company set aside as working capital of that company	429,123
Net surplus	598,817
	$12,504,120

THE J. G. BRILL COMPANY AND SUBSIDIARY COMPANIES.
SALES AND EXPENDITURES FOR YEAR 1910.

Total sales and other income	$5,960,778
Less operating, general and administration expenses	5,519,822
Profit for year	$440,956
Less amount set aside and added to reserve for depreciation	114,624
Net profit undistributed, added to surplus	$326,332
Surplus account, from previous year	$1,080,004
Less adjustments	57,797
	$1,022,207
Profit as above	326,332
	$1,348,539
Less dividends paid during year	320,600
Total combined surplus	$1,027,939
Less part of this combined surplus represented by surplus of Wason Manufacturing Company, and now set aside for permanent surplus of that company as an addition to its working capital	429,122
Net surplus	$598,817

Third Avenue Railroad Reorganization

James N. Wallace, chairman of the bondholders' committee of the Third Avenue Railroad, New York, N. Y., has made public a letter written recently by the committee to Robert A. Chesebrough in answer to certain statements made by him in a circular which he proposes to send to the holders of the first consolidated 4 per cent bonds of the Third Avenue Railroad. Mr. Chesebrough and the Chesebrough Building Corporation some time ago brought suit against the bondholders' committee to enjoin it from carrying out the reorganization plan.

Mr. Wallace asserts that the reorganization has not been unduly delayed by the committee. He reviews the various proceedings before the Public Service Commission and the ultimate rejection of the reorganization plan by the commission, followed by application to the Supreme Court in certiorari proceedings. Unless delayed by the Public Service Commission, counsel for the committee expects to argue the matter before the Appellate Division within the next 60 days, and to have the matter passed upon by the Court of Appeals by April or May, 1911, Mr. Wallace says. His letter adds:

"You state in your proposed circular that under the plan of reorganization the former stockholders of the Third Avenue Railroad Company were allotted $6,400,000 of bonds which you say are given to them. As a matter of fact, the stockholders are assessed $7,200,000 in cash, and against this assessment they are entitled to $6,400,000 of new bonds taken at their face value, and to stock for only 45 per cent of the par value of their present holdings, which stock was originally issued at par for cash. To characterize this issue of $6,400,000 of bonds as a gift or bonus to the former stockholders, as you do in your proposed circular, is both inaccurate and misleading."

Mr. Wallace asserts that the reorganization plan has been approved by more than 98 per cent in amount of the holders of the consolidated mortgage bonds.

There is also made public a letter to Mr. Wallace by F. W. Whitridge, receiver of the Third Avenue Railroad, stating that gross receipts of the company for the six months ended Jan. 1, 1911, exceeded those of the corresponding period in 1909 by $165,000, and that the net earnings for the same period, after the payment of all taxes and interest of the underlying bonds, as well as on $3,000,000 receivers' certificates, were $995,764. Mr. Whitridge added: "Included in the operating expenses for this six months was an increase in the wages, my own salary, and about $125,000 of track and car work which I had expected to pay from the funds raised upon the reorganization. January shows an increase in gross over last year of $45,464. All this makes it reasonably certain that the net earnings of the property for the current year ending July 1, 1911, will exceed $2,000,000, the whole of which would be applicable to the payment of interest and dividends on new securities, less only a proper provision for depreciation."

Court Urges Adjustment of Chicago & Milwaukee Electric Railroad Affairs

Peter S. Grosscup, judge of the United States Court at Chicago, is quoted as having stated emphatically that unless the affairs of the Chicago & Milwaukee Electric Railroad are adjusted or the road is reorganized by March 15, 1911, he will not delay foreclosure proceedings against the company and that he will appoint another receiver to take charge of the company's affairs and bring about an immediate settlement. The present receivers have agreed to remain with the court as representative advisers. These receivers are: W. I. Osborne, vice-president of the Central Trust Company, Chicago; D. B. Hanna, Toronto, Can., vice-president of the Canadian Northern Railroad, representing Canadian interests; George M. Seward, representing the interests of A. C. Frost, who organized the road.

One of the principal reasons which urge the speedy termination of the receivership and more stable operating conditions is the need for an entrance into Chicago for the trains of this road. The present double-track line extends from Evanston, 12 miles north of Chicago, to the center of the business district of Milwaukee, 84 miles north of Chicago. The south half of the road serves a very thickly populated suburban territory. At present this suburban business to and from Chicago is handled very largely by steam railroad. The trains of the Chicago & Milwaukee Electric Railroad now connect at North Evanston with trains of the Northwestern Elevated Railroad Company, which require more than an hour to reach the business district of Chicago. The court in urging early settlement of the affairs of the company is stated to recommend the termination of the receivership because of the desire to hasten the negotiations for an entrance to Chicago over which the company can run its trains to the business center of the city. Two such entrances are said to be open: one by way of the present roadway and structure carrying the elevated trains now connecting at North Evanston with the trains of the Chicago & Milwaukee Electric Railroad and the other by way of an extension to connect with the Logan Square branch of the Metropolitan West Side Elevated Railroad, which has offered a plan for this route.

In adjusting the affairs of the Chicago & Milwaukee Electric Railroad it is expected that $1,250,000 will be required to take up receivers' certificates, about $1,750,000 more to rebuild temporary bridges, pay for the present floating debts and meet the present obligations to municipalities, and about $1,080,000 for miscellaneous improvement and to retire outstanding car trust certificates and judgment liens. Judge Grosscup pointed out that the main financial problem is to raise about $4,000,000 on the first mortgage of the road from Evanston to Milwaukee.

Chicago (Ill.) Consolidated Traction Company.—The bondholders' protective committee, consisting of William F. Harrity, chairman; John B. Parsons and Benjamin Wolf, Philadelphia; Henry G. Foreman and Edmund A. Cummings, Chicago, Ill.; Clarence J. Housman, New York, N. Y., and J. Nedson Vance, Wheeling, W. Va., in the matter of Chicago Consolidated Traction Company 4½ per cent bonds, has notified the depositing bondholders under the agreement of July 1, 1908, that the securities and cash to which they will be entitled will be distributed by the depositaries, viz., the Mercantile Trust Company, New York, and the Commercial Trust & Savings Bank, Chicago, Ill., upon presentation of their certificates of deposit. The Harrity committee, representing minority bondholders, obtained a judgment against the Chicago Railways. After negotiations with representatives of that company, the claim of the bondholders' protective committee was settled by the acceptance of $675,000, payable in bonds of the Chicago Railways, being $425,000 in first mortgage rehabilitation bonds; and $250,000 in "B" 4 per cent bonds, which will bear 5 per cent interest from and after Feb. 1, 1912. For each $1,000 Chicago Consolidated Traction Company bond deposited each depositor will receive $299.26 in first mortgage bonds and $187.56 in "B" bonds. Sufficient of the bonds received have been sold, the first mortgage bonds at 98⅜ and the "B" bonds at 82⅞, to provide funds for the payment in cash of fractional parts of bonds. The depositing bondholders have been notified to present their certificates of deposit and receive the securities and cash to which they are entitled under the terms of the agreement.

Columbus, Delaware & Marion Railway, Columbus, Ohio.—The coupons due on Aug. 1, 1910, on the first refunding mortgage 5 per cent bonds of the Columbus, Delaware & Marion Railway were paid on Feb. 1, 1911, with interest on the amount due, by the Mercantile Trust Company, New York, N. Y., with funds received from the receiver of the company. The interest due on Jan. 1, 1911, on the bonds of the Marion Railway, Light & Power Company was paid at maturity at the office of the Standard Trust Company, New York, N. Y.

Detroit (Mich.) United Railway.—The Detroit United Railway, Detroit, Mich., has declared a quarterly dividend of 1¼ per cent, payable on March 1, 1911. This is the first dividend which the company has paid since 1907, when 3¾ per cent was paid.

Fort Dodge, Des Moines & Southern Railroad, Boone, Ia.—Judge McPherson, in the Federal Court, has entered an order overruling the application to compel the Fort Dodge, Des Moines & Southern Railroad to operate the portion of the line between Newton and Des Moines Junction, 30 miles, which is part of the Newton & Northwestern Railway. The receiver has, however, directed the company to send cars with a locomotive twice a week for four weeks over the road to handle any freight that has accumulated. The statement is made that the gross receipts of this part of the line are much less than the operating expenses and that the $250,000 which would be necessary to electrify this division cannot be raised.

Hudson & Manhattan Railroad, New York, N. Y.—Holders of the 6 per cent notes of the Hudson Companies, due Oct. 15, 1911, have received from Harvey Fisk & Sons, New York, N. Y., a circular embodying an offer of the company to extend the notes for two years, to Oct. 15, 1913. A cash payment of $15 will be made on each $1,000 note if the holder accepts the offer of extension. The extended notes will also be convertible into bonds of the Hudson & Manhattan Railroad, which are pledged as security for the notes of the Hudson Company.

Ocean Shore Railroad, San Francisco, Cal.—The Ocean Shore Railway, the sale of which under foreclosure was noted in the Electric Railway Journal of Jan. 28, 1911, page 182, was taken over by the new owners in the name of the Ocean Shore Railroad, which is organized temporarily as follows: S. W. Reynolds, agent for owners; A. H. Otis, general manager; J. W. Crosby, auditor; W. F. Gleeson, general freight and passenger agent; F. M. Liston, purchasing agent and storekeeper; H. M. McCartney, chief engineer; C. M. Stansbury, master mechanic. It is reported that the recently incorporated United Properties Company of California is considering the purchase of the Ocean Shore Railroad with the idea of making it a part of the extensive system which it proposes to develop.

Philadelphia (Pa.) Rapid Transit Company.—The special committee of the directors of the Union Traction Company, consisting of Robert A. Balfour and George W. Elkins, which has been considering the plan proposed by E. T. Stotesbury, of Drexel & Company, Philadelphia, Pa., for refinancing the Philadelphia Rapid Transit Company has reported to the directors of the Union Traction Company the details of the plan and the report has been approved. The special meetings of the stockholders of the Philadelphia Rapid Transit Company and the Union Traction Company at which the plan will be presented will be held on Feb. 28, 1911.

Portland Railway, Light & Power Company, Portland, Ore.—A quarterly dividend of 1 per cent has been declared payable on the $16,250,000 of stock of the Portland Railway, Light & Power Company, as readjusted according to the plan to retire the preferred stock by redemption at 105, as noted in the Electric Railway Journal of Nov. 19, 1910, page 1044, and Dec. 10, 1910, page 1170. The dividend is payable on March 1, 1911, to holders of record of Feb. 11, 1911, and is the same rate as was paid from September, 1909, to December, 1910, on the $10,000,000 of common stock of the company, the amount outstanding prior to the retirement of the $5,000,000 of preferred stock.

Rochester Railway & Light Company, Rochester, N. Y.—The Public Service Commission of the Second District of New York has authorized the Rochester Railway & Light Company to issue $832,000 par value of its first consolidated 5 per cent gold mortgage bonds. The proceeds derived from the sale of the bonds are to be used to pay indebtedness incurred for proper capital purposes. The order requires that the bonds shall be sold at not less than 95.

York (Pa.) Railways.—A special meeting of the stockholders of the York Railways has been called for March 21, 1911, to act on the question of approving a proposed issue of not exceeding $700,000 par value of short-term 6-per cent collateral trust gold notes of the company, secured by a pledge of the company's first-mortgage 5 per cent gold bonds maturing Dec. 1, 1937, in the sum of $840,000, or a ratable part thereof, as collateral security for payment.

Dividends Declared

Detroit (Mich.) United Railway, 1¼ per cent.

Elmira Water, Light & Railroad Company, Elmira, N. Y., 2½ per cent, preferred.

Northern Texas Electric Company, Fort Worth, Tex., 3 per cent, preferred; quarterly, 1½ per cent, common.

Rochester Railway & Light Company, Rochester, N. Y., quarterly, 1¼ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

CENTRAL PENNSYLVANIA TRACTION COMPANY.

Period.			Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.
1 m.,	Dec.	'10	$73,791	$51,073	$22,718	.....	.....
1 "	"	'09	66,741	49,292	17,449	.....	.....
12 "	"	'10	831,167	591,501	239,666	.....	.....
12 "	"	'09	754,488	558,812	195,676	.....	.....
DETROIT UNITED RAILWAY.							
1 m.,	Dec.	'10	$779,973	$494,278	$285,695	$166,760	$118,935
1 "	"	'09	708,864	427,941	280,923	156,730	124,193
12 "	"	'10	9,497,987	5,981,065	3,516,922	2,030,622	1,486,300
12 "	"	'09	8,192,389	5,042,724	3,149,665	1,880,129	1,269,536
MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY.							
1 m.,	Dec.	'10	$428,652	$285,203	$143,448	$10,860	$132,589
1 "	"	'09	400,354	271,626	128,728	23,031	105,697
12 "	"	'10	4,789,815	3,304,902	1,484,912	527,076	957,836
12 "	"	'09	4,355,007	2,844,384	1,510,623	543,345	967,278
MILWAUKEE LIGHT, HEAT & TRACTION COMPANY.							
1 m.,	Dec.	'10	$177,294	$51,255	$126,039	$48,161	$77,878
1 "	"	'09	166,770	46,584	120,187	55,610	64,577
12 "	"	'10	1,847,788	645,170	1,202,619	656,411	546,207
12 "	"	'09	1,519,780	549,774	970,006	621,640	348,366
NORFOLK & PORTSMOUTH TRACTION COMPANY.							
1 m.,	Dec.	'10	$179,111	$94,878	$84,233	$60,491	$23,742
1 "	"	'09	163,444	93,393	68,051	65,242	2,809
6 "	"	'10	1,079,822	598,058	481,764	377,260	104,504
6 "	"	'09	988,412	554,735	433,677	381,394	52,283
ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY.							
1m.,	Dec.	'10	$96,048	*$51,015	$45,033	$19,221	$25,813
1 "	"	'09	92,087	*49,329	42,758	17,967	24,791
12 "	"	'10	1,038,056	*601,973	436,083	221,485	214,598
12 "	"	'09	979,554	*551,612	427,942	210,926	217,016

*Includes taxes.

Traffic and Transportation

Marketing Farm Products by Electric Railway

Edward C. Spring, traffic manager of the Lehigh Valley Transit Company, Allentown, Pa., addressed the Movable School of Agriculture at Allentown recently on "The Relation of the Farmer to the Transportation Companies." Mr. Spring said, in part:

"Much has been told the farmer about how to prepare the ground, till the soil and plant to produce the best results, but little has been told him about how to find a market for his product after its development. The electric railways during the past few years have brought about a wonderful change in the farming communities. The handling of fruit and garden truck on account of the dispatch of carrying these perishable goods is fast becoming of great importance not only to the interurban companies, but to the farmer. The placing of the farmer in close touch with the markets of the civilized world through the medium of electric railways offers in itself one of the greatest inducements to a farming community. Freight stations and platforms are erected along the lines to enable the handling of freight more carefully and with greater dispatch, which also make a convenient place for the transfer of goods to the teamster. In all cases the interurbans are offering better inducements to the shippers than the steam roads, and as the industrial and commercial needs press the electric railways to keep pace with the demand for greater freight transportation, this need will be met in the same energetic and progressive manner as has characterized the past development of passenger transportation. The carrying of the daily papers and mail by the electric railways, with rural free delivery, causes them to reach the farmer as soon as the business man in the large cities, putting him in an independent position in placing his commodities.

"The community in and about Allentown is splendidly served, as far as the farmer is concerned, by the Lehigh Valley Transit Company, which, having recently established a fast express service at freight rates between points on its line and Philadelphia, is in a position to cater to the wants of the farmer in the placing of his product. The establishment of a brokerage department by the company, whereby the farmer can secure a market for his commodity without going to the city or taking up his time, but by simply getting in touch with the Electric Express Company, which is in communication with the markets of Philadelphia and vicinity, enables him to have his goods placed almost immediately. The company performs the service without any expense to the farmer. Such features as these make an ideal service, which cannot but appeal to the farmer and be appreciated by him.

"The time is past when the farmer does not put a valuation upon his own time and that of his team. With up-to-date farming management these two factors are entering in the maintenance account to a large extent. Where the farmer can place his commodities upon the electric cars he can utilize not only his own time but that of his team to a great advantage at home rather than driving to market. There is no agency that has done more than the advent of the electric railways to broaden out the social conditions of the farmer and his family; his children can enjoy the advantages offered by adjacent cities in the matter of education, libraries and many other things which tend to elevate and make the home more beautiful and more attractive.

"The exodus of the young man from the farm to the cities is an extremely alarming problem. The seductive environment of our large cities has attracted many boys into a problematical future, and every father and every mother should see to it that the home environments and the pleasures and recreations that are allowed the boy are of such a nature and of such attraction that the boy will have inducements to keep him in a position which offers him greater possibilities to-day and a greater future than any line, either professional or commercial, can offer him in the large cities of the country. Every boy on the farm should weigh well his condition and compare his station in life with that which must needs come after he leaves the farm. The independence, the freedom of action, the unrestricted life and healthy environments which are characteristic of the farmer's life are not to be found in any other walk of life. You have no greater ally than the transportation companies in the development and the maintenance of your great work."

Hartford & Springfield Street Railway's Express Service.—The Hartford & Springfield Street Railway, Warehouse Point, Conn., has established express service between Somers, Somerville, Thompsonville, Enfield and Warehouse Point.

Freight Service Between Philadelphia and Reading.—The Reading (Pa.) Transit Company has announced that it will establish freight service between Chestnut Hill, Philadelphia, and Pottstown. The plan is eventually to establish service between Philadelphia and Reading.

Complaint About Service in Troy.—The Public Service Commission of the Second District of New York has received a complaint from the Common Council of Troy asking for an investigation and report as to the need of better service by the United Traction Company in the north end of Troy.

Transfers in Bronx Borough.—Frederick W. Whitridge, receiver of the Union Railway, has notified the Public Service Commission of the First District of New York that he has arranged with the New York City Interborough Railway to exchange transfers between lines of the two companies at West Farms. The New York City Interborough Railway, which is controlled by the Interborough Rapid Transit Company, recently put a line into operation in Tremont Avenue as far east as Unionport. Ultimately it will be extended to Locust Point, on the Sound. Transfers will be exchanged between this line and the Boston Road and Southern Boulevard lines of the Union Railway in the Borough of the Bronx.

Fare Between St. Louis and East St. Louis.—Alleging that a reduction of the rate of fare across the Mississippi River at St. Louis would be ruinous to them, the street railways operating between St. Louis and East St. Louis asked an injunction against the City of East St. Louis in the Federal Court at Danville, Ill., on Feb. 8, 1911, to prevent a change. Judge Francis Wright took the matter under advisement. Attorneys for the complainants in their bill assert the bridges across the Mississippi were constructed at great cost and if the fare is reduced from 10 cents to 5 cents it would be impossible to realize a sufficient percentage on the investment to pay the interest, operating expenses and accumulated debts. The East St. Louis Railway and the East St. Louis Electric Railway are the complainants in the action.

Increase in Fare by Toledo & Chicago Interurban Railway.—The Toledo & Chicago Interurban Railway, Kendallville, Ind., announced an increase in its round-trip fares and in its single tickets from Fort Wayne to Kendallville, Auburn and Waterloo, effective on Feb. 1, 1911. Previous to Feb. 1, 1911, the round-trip fare from Fort Wayne to Kendallville was $1 and the single fare 55 cents. Under the new schedule the round-trip rate is $1.15 and the single fare to Fort Wayne 65 cents. The round-trip rate to Auburn previous to Feb. 1, 1911, was 85 cents and the single fare 50 cents, while under the new tariff the rates are 90 cents and 50 cents respectively. An increase of 5 cents and 10 cents is made in the single and round-trip rates to Waterloo. The present round-trip rate is $1, while the new rate is $1.10. The single-trip rate, formerly 55 cents, is now 60 cents.

Interstate Commissioner Inspects Illinois Traction System.—James S. Harlan, of Illinois, member of the Interstate Commerce Commission, announced recently that he would inspect the Illinois Traction System principally to obtain information whereby the provisions of the safety appliance law could be interpreted with regard to the interurban electric railways engaged in interstate commerce. Mr. Harlan was quoted as follows in regard to the proposed inspection: "I wish to become thoroughly informed about the business of the Illinois Traction System, and a considerable part of the distance between St. Louis and Chicago will be included in a trip over that company's lines. The electric railways engaged in interstate traffic are subject to the commission, and we have had

several cases relating to the Illinois Traction System. I desire to learn all I can about the properties."

Proposed Traffic Agreement in Detroit.—Brief mention was made in the Electric Railway Journal of Feb. 11, 1911, page 283, of the proposed operating agreement between the Detroit United Railway and the Michigan United Railway. Wm. B. Thompson, Mayor of Detroit, has expressed himself as being opposed to any operating agreement being entered into between the companies, and has written the following letter to the Michigan United Railways: "I have been informed from reliable sources that your company is about to enter into a contract or agreement with the Detroit United Railway whereby your cars will be operated in this city upon the lines and over the tracks of the Detroit United Railway. I wish to call your attention to the fact that the Detroit United Railway has no franchise rights upon a great many of the streets in this city, and we hope that within a short time the courts, where litigation to that end is now pending, will have so declared. You are therefore hereby notified that this city will, so far as my power extends, resist the right of your company to occupy the streets and operate cars upon tracks now laid or hereafter to be laid unless you first secure permission from the municipality. If you proceed to carry out any arrangement with the Detroit United Railway to bring your cars into this city over its tracks you may expect to meet with the opposition of the authorities of this city so far as I am able to control the situation."

Bridge, Tunnel and Ferry Traffic in New York.—The Public Service Commission has issued a report showing the annual count of passenger traffic across the East River between Manhattan and various parts of Long Island taken on Nov. 10 and 11, 1910, beginning at midnight on Nov. 9. The Brooklyn and Williamsburg bridges and the ferries were taken on Nov. 10; the subway, the Pennsylvania Railroad tunnels and the Queensboro Bridge on Nov. 11. A separate count of the Manhattan Bridge was made on Nov. 17, 1910. The Queensboro Bridge showed the largest ratio of increase over 1909, namely, 68.5 per cent; the Williamsburg Bridge increased 13.5 per cent, the subway 8.5 per cent and the Brooklyn Bridge 4.6 per cent. The ferries showed a loss of 1 per cent. The count includes passengers crossing the ferries in horse vehicles and automobiles, which were not included in the count of 1909. The total number of persons crossing from Long Island to Manhattan was 491,220, an increase of 47,555 over 1909; the total number crossing from Manhattan to Long Island was 487,797, an increase of 50,575. In percentages the traffic to Manhattan increased 10.7 per cent, while that from Manhattan increased 11.3 per cent. The combined figures show that the total traffic both ways across the river is closely approaching the 1,000,000 mark, having been 979,023 for one day in 1910. Allowing for the loss of 1418 in ferry traffic, this was a net gain for the year of 96,712, or 11 per cent.

Effort to Reduce Railway Casualty Records.—The League of Public Safety, with headquarters at Chicago, Ill., is making a national effort to reduce the loss of life in railway operation throughout the United States by seeking statutes to prohibit trespassing on rights of way, which is one of the major causes for casualties, the enlistment of railway officials and employees in a systematic war on accidents and also the adoption of safeguards. According to the last bulletin of the League of Public Safety the efforts will be along well-defined and constructive lines. It states that "about half of the persons killed and injured in railway accidents in the United States are making a thoroughfare of dangerous ground and in a great many cases railway rights of way. In most States there are no laws to prohibit trespassing and children and others who do not know the hazard may go into that danger and do and are killed because no one is empowered to stop them." The bulletin also states that "signal safeguards must be more generally adopted. Only 65 per cent of the steam railway and practically none of the electric interurban mileage is protected." The organization, practically completed, is now in the hands of a board representing the State railroad commissions of Indiana, Mississippi, Illinois and Louisiana, the Red Cross Society, Federation of Women's Clubs, casualty insurance interests and other organizations. W. J. Wood, Railroad Commissioner of Indiana, is chairman.

Personal Mention.

Mr. A. E. Peters, formerly assistant secretary of the Detroit (Mich.) United Railways, has been elected secretary of the company to succeed Mr. Edwin Henderson

Mr. John I. Beggs, president and general manager of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been elected president of the St. Louis Car Company, St. Louis, Mo.

Mr. Edward Missner, chief clerk of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been appointed assistant to Mr. John I. Beggs, president of the St. Louis Car Company, St. Louis, Mo.

Mr. T. E. Rust, chief engineer of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., will hereafter perform the duties which devolved upon the late M. L. Newton as consulting engineer of the company.

Mr. L. H. Lathrop has been appointed superintendent of the Menominee & Marinette Light & Traction Company, Menominee, Mich., to succeed Mr. W. R. Putnam, whose resignation from the company was announced recently in the Electric Railway Journal.

Mr. James P. Kineon has resigned as superintendent of transportation of the New York & Long Island Traction Company and the Long Island Electric Railway, Jamaica, N. Y., and has accepted a position as superintendent of the Ocean Electric Railway, Glen Cove Railway, Northport Traction Company, Nassau County Railway and the Huntington Railway, all controlled by the Long Island Railroad, effective Feb. 15, 1911.

Mr. W. A. Haller has again become connected with Sanderson & Porter, engineers and contractors, New York, N. Y. Mr. Haller was associated with Sanderson & Porter from 1900 until 1908, at which time he became general manager of the Mobile Light & Railway Company, Mobile, Ala. Early in 1909 he took the position of general manager and engineer of the Oklahoma Railway Company, which position he has filled until recently.

Mr. V. W. Berry, who has been master mechanic of the Houston (Tex.) Electric Company, has been appointed superintendent of the Galveston-Houston Electric Railway, and superintendent of rolling stock of the Houston Electric Company, Galveston Electric Company and the Galveston-Houston Electric Railway. Mr. Berry has been in the employ of the Stone-Webster Management Association for six years as master mechanic of the Dallas Street Railway, master mechanic of the Houston Electric Company and district master mechanic for all the Stone & Webster properties in Texas. He has had 15 years' active experience in handling city and interurban railways.

Mr. I. B. Clarke has been appointed superintendent of the New York & Long Island Traction Company, with headquarters at Hempstead, Long Island, and of the Long Island Electric Railway, with headquarters at Jamaica. Mr. Clarke has recently been assistant superintendent of elevated lines of the Brooklyn Rapid Transit Company and as such won an enviable record in the successful handling of men. He is a native of Atlanta, Ga., and a graduate of Cornell University in the class of 1900. After leaving college Mr. Clarke was with the Westinghouse Air Brake Company for a short while and became connected with the Brooklyn Rapid Transit Company in 1905 as supervisor of elevated motormen. While in this position he devised and placed in execution a very successful method of training the men in charge of the elevated trains. He extended this system later when he was made supervisor of motormen for both the elevated and the surface lines. Mr. Clarke was appointed assistant superintendent of elevated lines of the Brooklyn Rapid Transit Company on June 21, 1908.

OBITUARY

William La Croix, president of the Nahant & Lynn Street Railway, Lynn, Mass., is dead.

George Moses, Eastern and Southern representative for James B. Sipe & Company, died Jan. 15, 1911, at Pittsburgh, Pa.

Edward Merritt, president of the Brooklyn (N. Y.) City Railroad, a subsidiary of the Brooklyn Rapid Transit Company, is dead.

Construction News

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

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

RECENT INCORPORATIONS

Sand Springs Interurban Railway, Tulsa, Okla.—Incorporated in Oklahoma to build a 6-mile electric railway to connect Tulsa and Sand Springs. Capital stock, authorized, $50,000; issued, $50,000. Power will be obtained from the Tulsa Corporation, and repair shops will be located at Sand Springs. Officers: Charles Page, Tulsa, president; W. E. Rohde, Tulsa, superintendent, and W. H. Henderson, chief engineer. Headquarters, 417 First National Bank Building, Tulsa, Okla. [E. R. J., Feb. 4, '11.]

Pittsburgh, Butler, Slippery Rock, Grove City & Northern Street Railway, Butler, Pa.—Application for a charter will be made in Pennsylvania on Feb. 29 by this company to build a 26-mile electric railway to connect Butler, Slippery Rock, Grove City, Prospect, West Liberty, Center, Franklin, Brady, North Liberty and Pine. Incorporators: William C. McCandless, John Troutman, F. L. Forrester, John C. Kerr and William M. Galbraith. [E. R. J., Oct. 8, '10.]

Moose Jaw (Sask.) Electric Railway, Ltd.—Incorporated in Saskatchewan to build an electric railway in Moose Jaw and to the adjoining towns. Capital stock, $500,000. Incorporators: D. R. Street, A. H. Dion and N. J. Ker, all of Ottawa. [E. R. J., Nov. 26, '11.]

Terrell Well Company, San Antonio, Tex.—Incorporated in Texas to build a 5-mile electric railway to connect San José and San Antonio. Construction has begun. The company will purchase power from the San Antonio Traction Company and will operate five cars. Capital stock, authorized, $100,000. Stock issued, $100,000. Officers: C. D. Garrett, St. Louis, president; J. D. Oppenheimer, San Antonio, vice-president; A. L. Matlock, San Antonio, secretary; Dr. Frederick Terrell, San Antonio, treasurer; A. D. Powers, San Antonio, general manager and purchasing agent; H. W. Hamilton, superintendent, and W. J. Kelly, chief engineer. [E. R. J., Jan. 21, '11.]

Washington & Barcroft Traction & Power Company, Barcroft, Va.—Incorporated in Virginia to build a 7-mile electric railway through Alexandria and Fairfax counties. Officers: F. C. Handy, Barcroft, president; W. W. Wright, Barcroft, vice-president, and C. B. Munson, Arlington, secretary.

FRANCHISES

Los Angeles, Cal.—The Los Angeles-Pacific Railway has asked the City Council for permission to electrify the old Santa Monica steam railroad, which extends from Clements Junction, at Thirty-eighth Street and Alameda Street, west across Los Angeles to the west boundary, and then directly to Santa Monica.

Los Angeles, Cal.—The Los Angeles Railway has asked the City Council for a franchise to build a cross-town line in Los Angeles.

Modesto, Cal.—The San Joaquin Valley Electric Railway has received a franchise from the Trustees to build its railway over certain streets in Modesto.

Petaluma, Cal.—The Petaluma & Santa Rosa Railway has received a franchise from the City Council to build an extension along the river to Point Pedro. E. M. Van Frank, president. [E. R. J., Feb. 11, '11.]

Meriden, Conn.—The Meriden, Middletown & Guilford Railway, Meriden, has asked the General Assembly for an extension of time in which to build its proposed 20-mile electric railway from Meriden to Guilford, via Middletown, and for the right to extend the line into North Branford and in Middletown. Francis Atwater, Meriden, president. [E. R. J., Nov. 20, '09.]

Gary, Ill.—The Gary & Interurban Railway has received a franchise from the Council to extend its line to the city limits on South Broadway in Gary.

***Paris, Ill.**—Charles F. Propst will ask the Council for a franchise to build a line into Paris. The railway is projected between Mattoon and Charleston.

Urbana, Ill.—The Danville, Urbana & Champaign Railway has received a franchise from the City Council to build its electric railway on Cunningham Avenue, in Urbana.

New Bedford, Mass.—The Union Street Railway, New Bedford, will ask the Board of Aldermen for a franchise to extend its railway to Bolton Road in the south end of New Bedford.

***Scituate, Mass.**—The citizens of Scituate will ask the Council for a franchise to build an 8-mile electric railway between Scituate Harbor and Rockland.

Lambertville, N. J.—The New Jersey & Pennsylvania Traction Company has received a franchise from the Board of Public Utility Commissioners to extend its tracks in Lambertville.

White Plains, N. Y.—The Hudson River & Eastern Traction Company, Ossining, has filed an application with the Public Service Commission for permission to construct its railway from Ossining to White Plains, via Sherman Park.

***Rocky Mount, N. C.**—W. H. Howell, Scotland Neck, and Robert McDonald, Tarboro, representing Baltimore capitalists, will ask the Aldermen for a franchise to build an electric railway through Rocky Mount.

Geneva, Ohio.—The Cleveland, Painesville & Ashtabula Railroad, Cleveland, will ask the City Council for a seven-year extension of its franchise to build its railway in Geneva.

Youngstown, Ohio.—The Lake Erie & Youngstown Railway has received a franchise from the City Council to build its line in Youngstown. It will connect Conneaut, Andover and Youngstown, also with the Youngstown & Southern Railway, which extends from Youngstown to East Liverpool. [E. R. J., Aug. 28, '09.]

Ottawa, Ont.—The Morrisburg & Ottawa Electric Railway, Ottawa, has asked the Council for a franchise to build its railway along Main Street to connect with the Ottawa Street Railway in Ottawa. C. M. Willard, Morewood, Ont., president. [E. R. J., Nov. 14, '08.]

Sarnia, Ont.—The Imperial Traction Company, Hamilton, has asked the Common Council for a franchise to build an electric railway in Sarnia. It will connect Hamilton, Guelph, Berlin, Stratford, St. Mary's, London, Ingersoll, Woodstock, Brantford, Niagara Falls and Sarnia. L. B. Howland, Toronto, is interested. [E. R. J., Dec. 31, '10.]

Campbelltown, Pa.—The Lebanon & Campbelltown Street Railway has asked the City Council for a franchise to build an electric railway in Campbelltown. S. M. Hershey is interested. [E. R. J., Dec. 31, '10.]

***Mauch Chunk, Pa.**—Franchises are being obtained by Philadelphia capitalists from the Councils to construct an electric railway between Slatington and Lehighton, to connect with the Lehigh Traction Company at Slatington and with the Carbon Transit Company at Lehighton. This railway will be 12 miles long, and when completed will be the connecting link from Pottsville to Philadelphia. It will pass through Palmerton, Hazard, Bowmanstown, Parryville, Harrity and Weissport.

Waco, Tex.—The Citizens' Railway has received a franchise from the City Commissioners to extend its railway on North Ninth Street in Waco.

Norfolk, Va.—The Norfolk & Portsmouth Traction Company, Norfolk, has received a franchise from the Mayor and City Council to lay T-rails on Olney Road and Botetourt Street in Ghent.

Spokane, Wash.—The Spokane & Inland Empire Railroad has received a franchise from the City Council to extend its line over certain streets in Spokane.

Wheeling, W. Va.—The Pan-Handle Traction Company, Wheeling, has asked the City Council for a 50-year franchise to construct a third-rail line from Jonathan's Ravine north to the city limits.

TRACK AND ROADWAY

Fresno, Coalinga & Tidewater Company, Fresno, Cal.—This company advises that it proposes to build the Fresno, Coalinga & Monterey Railway and as soon as surveys are made it will begin the construction of the railway to connect Fresno, Coalinga, Hollister, Salinas and

Monterey. Capital stock authorized, $100,000; capital stock issued, $30,000. Officers: T. C. White, Fresno, president; Charles J. Shaw, Hollister, vice-president and general manager; Albert Albrecht, Fresno, secretary; H. H. Alexander, treasurer, and J. S. Bates, Fresno, electric engineer. [E. R. J., Feb. 4, '11.]

Monterey & Del Monte Heights Railway, Monterey, Cal.—During this year this company will build a 1½-mile extension from the center of Monterey to the city limits and a 16-mile extension from Del Monte Heights to Salinas.

Northern Electric Railway, San Francisco, Cal.—Contracts have been awarded to the American Bridge Company, New York, N. Y., by this company for steel work and machinery for two 125-ft. fixed spans and one 400-ft. draw span constituting material for joint railway and highway bridge across the Sacramento River at foot of M Street, Sacramento, connecting Yolo and Sacramento Counties. The Missouri Valley Bridge & Iron Company, Leavenworth, Kan., has been awarded the contract for piers, abutments and foundation for above bridge. The company will soon award the contracts for the erection of steel work and electrical machinery and interlocking signal system.

Brooklyn, Conn.—William Clewley, who is promoting an electric railway to connect Brooklyn, Danielson and Ballouville, is making preparations to survey the route. [E. R. J., Nov. 19, '10.]

Middle Georgia Interurban Railway, Atlanta, Ga.—Work has been begun by this company on its railway between Jackson, Griffin and Social Circle. Grading is being done from Indian Springs to Jackson.

Indianapolis, Crawfordsville & Western Traction Company, Crawfordsville, Ill.—An extension of 42 miles will be built by this company to connect Crawfordsville, Ind., and Danville, Ill., during 1911.

Chicago, Ottawa & Peoria Railway, La Salle, Ill.—This company, which is a part of the Illinois Traction System, advises that it will award contracts within the next few weeks for grading and for concrete and bridge construction work on its 25-mile extension between Morris and Joliet. F. E. Fisher, superintendent of construction, Joliet, Ill., is in charge of the work.

Illinois Traction System, Peoria, Ill.—This company is preparing plans for a 30-mile extension from Beatrice to Adams. The proposition provides that the amount of $300,000 of stock must be subscribed by Gage County in order to build this extension. The matter is being considered by the Commercial Club of Beatrice.

Albia (Ia.) Interurban Railway.—A 9-mile extension will be built from Albia to Baxton by this company during 1911.

Tri-City Railway, Davenport, Ia.—Surveys are being made and construction is about to begin by this company on its 20-mile extension between Davenport and Muscatine. The company plans to double-track the line on the principal streets of all the cities in which it operates. Funds to carry out these plans will be raised by the sale of bonds.

Lexington & Interurban Railways, Lexington, Ky.—About 2 miles of new track will be constructed by this company in Lexington during 1911.

Winnipeg (Man.) Electric Railway.—Several extensions, including a line to Winnipeg Beach, will be built by this company during this year.

Winona Railway & Light Company, Winona, Minn.—About one mile of new track will be built by this company in Winona during 1911.

Mankato (Minn.) Electric Traction Company.—This company expects to make a permanent survey in the spring for its proposed extension between Mankato and St. Peter. Henry E. Hance, Mankato, general manager.

Interstate Railway, Kansas City, Mo.—About 48 miles of main track and 5 miles of sidings will be built during 1911 by this company.

Kansas City, Lawrence & Topeka Electric Railroad, Kansas City, Mo.—A 24-mile extension to connect Zarah and Lawrence will be constructed by this company during 1911.

Grands Forks (N. D.) Street Railway.—This company expects to build during the year a 1-mile extension from Grand Forks to East Grand Forks.

Ohio Electric Railway, Cincinnati, Ohio.—As a result of recent arrangements for financing the needs of this company it is stated that the line extending from Columbus to Newark and Zanesville will be greatly improved, the interurban depot at Columbus will be built and connections and extension east of Columbus will probably be made.

Fostoria & Fremont Electric Railway, Fostoria, Ohio.—The temporary injunction which prevented this company from entering the land owned by the Lake Erie & Western Railroad at Hamler was dissolved by Judge W. P. Henderson on Feb. 6, and the work delayed at this point will be completed at once. J. D. McDonel, secretary. [E. R. J., Jan. 7, '11.]

***Lancaster, Ohio.**—J. H. Litteral, Dr. F. P. Barr and C. W. Rowlee, Lancaster; D. L. Mauger, Basil; E. E. Haskins, Granville, and George Ruffner and Clark Suphen, Baltimore, Ohio, are at the head of a movement to build an electric railway between Lancaster and Buskeye Lake, a distance of 20 miles, and it is said that a company will be incorporated shortly for that purpose. The line will pass through Thurston and Pleasantville, and have its northern terminus at Summerland Beach. It will enter Lancaster over the tracks of the Scioto Valley Railway, it is said. At Buckeye Lake it will connect with the Newark line of the Ohio Traction Company. Spurs will be built to Basil and Baltimore.

Southeastern Ohio Railway, Light & Power Company, Zanesville, Ohio.—It is said that the directors of this company have decided to extend the railway from Crooksville to New Lexington, Ohio, during the coming summer. It will not follow the Cincinnati & Muskingum Valley Railroad, as at first planned, but will run direct across the country through McLuney, Wilbren and Rehoboth.

Toronto (Ont.) Railway.—This company will finish building about 20 miles of single track in Toronto during 1911.

Toronto Suburban Railway, Toronto Junction, Ont.—A 15-mile extension from Toronto to Brampton will be built by this company during 1911.

Oregon Electric Railway, Portland, Ore.—This company will build from Albany to Eugene, a distance of 70 miles, during 1911.

Schuylkill & Dauphin Traction Company, Pottsville, Pa.—A 3-mile extension will be built by this company during 1911.

Scranton & Binghamton Traction Company, Scranton, Pa.—It is stated that this company will soon begin work on an extension of the Northern Electric Railway from Factoryville to Nicholson, Binghamton, Brooklyn and Montrose. Rights-of-way have been secured and surveys made as far as Binghamton. This proposed 62-mile electric railway will connect Franklin Forks, Lansville, Conklin, Corbettsville, Brooklyn, Lindaville, Montrose and Binghamton. W. L. Connel, Scranton, president. [E. R. J., Oct. 29, '10.]

Shawinigan Water & Power Company, Montreal, Que.—This company expects to electrify about 5 miles of steam railroads in Montreal during 1911.

Sioux Falls (S. D.) Traction System.—About 3 miles of new track will be built in Sioux Falls by this company during 1911.

Corpus Christi Street & Interurban Railway, Corpus Christi, Tex.—During 1911 this company will build about 6 miles of new track in Corpus Christi.

Spokane Northern Electric Railway, Spokane, Wash.—This company advises that it has completed surveys, secured rights-of-way and begun grading for its proposed 35-mile railway to extend from Spokane to the top of Mount Carlton. The company will probably furnish power for lighting purposes. Capital stock authorized, $250,000. Stock issued, $250,000. Officers: Francis H. Cook, 307 Howard Street, Spokane, president; L. C. Cook, secretary, and Silas W. Cook, treasurer. [E. R. J., March 23, '07.]

Tomahawk, Wis.—S. S. Fuller, who is promoting a 25-mile electric railway to connect Martinsburg, North Mountain, Hedgesville, Tomahawk, Jones Spring, Shenhei, Ganotown and Glengary, states that he has been appointed treasurer to raise funds for constructing this line. Work will not be begun until spring. [E. R. J., Jan. 7, '11.]

SHOPS AND BUILDINGS

Los Angeles (Cal.) Railway.—This company is having a paint shop built on Fifty-ninth Strect and San Pedro Street in Los Angeles. The structure will be two stories high, 640 ft. x 110 ft., of reinforced concrete construction. [E. R. J., Sept. 24, '10.]

Southern Pacific Railroad, Los Angeles, Cal.—This company will erect a new car house on the site of the narrow-gage station at Fourteenth Street and Franklin Street extending through to Webster Street in Los Angeles. The first floor will contain the ticket offices, waiting rooms and the telegraph and dispatching departments.

Tampa (Fla.) Electric Company.—Plans are being prepared by this company for building new car houses on the tract near the river in the northern part of Tampa. The cost is estimated to be about $150,000.

Detroit (Mich.) United Railways has recently made extensive improvements to its repair shops and has added a vacuum drying and impregnating apparatus for its field coil work. The company has purchased the improved type of apparatus, having cast-iron steam-jacketed tanks, manufactured by the Buffalo Foundry & Machine Company, Buffalo, N. Y.

Great Falls Electric Properties, Butte, Mont.—This company is considering plans for the construction of new car houses and repair shops and the purchase of new equipment to replace the structures and stock lost in the recent fire.

Public Service Railway, Newark, N. J.—It is reported that this company will erect car houses on its property recently acquired in Hilton.

Portland Railway, Light & Power Company, Portland, Ore.—This company has purchased ten acres of land in southeast Portland, on which it proposes to erect its general shops. Plans for the new structures are now being prepared. They will be built in units and will consist of a machine shop, blacksmith shop, carpenter and paint shops. The company now operates shops at four different points and this new plan will provide for a consolidation of all these shops into one plant. It is also the intention of the Portland Railway, Light & Power Company to build its own cars at this plant eventually.

POWER HOUSES AND SUBSTATIONS

Kentucky Securities Corporation, Lexington, Ky.—Plans are being considered by this company for building a large power plant in Lexington. J. K. Trimble, Philadelphia, secretary. [E. R. J., Feb. 4, '11.]

Michigan United Railways, Detroit, Mich.—This company is now considering the advisability of installing its own power plants. To this end an engineering corps composed of expert electrical engineers under the direction of G. N. Lemmon, chief engineer for the Michigan United Railway, with headquarters in Jackson, has been set to work making necessary observations and preliminary calculations. In planning the installation of a new system the location of a number of plants and substations will come under the jurisdiction of the engineers in charge of the work, and it is not anticipated that anything definite as to the location of the plants will be ready for announcement before 60 days.

Metropolitan Street Railway, New York, N. Y.—This company is said to be considering plans for building an additional coal hoist at its power station at First Avenue and Ninety-sixth Street in New York. The cost is estimated to be about $50,000.

Northern Ohio Traction & Light Company, Akron, Ohio.—This company has ordered from the General Electric Company one 1000-kw motor generator set and one 75-kw motor generator and one 1500-hp motor and switchboard.

San Juan Light & Transit Company, San Juan, Porto Rico.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for seven 30-kva, single-phase, 60-cycle, 1100/110-220-volt transformers; five 25-kva, single-phase, 60-cycle, 1100/110-220-volt transformers and a total of 200 hp in small back-geared motors for a machine shop.

Manufactures & Supplies

ROLLING STOCK

Mountain Railway, West Orange, N. J., expects to purchase two passenger cars.

Cleveland & Erie Railway, Girard, Pa., will purchase one 47-ft. 2-in. interurban car.

Lincoln (Neb.) Traction Company has ordered one 21-E truck from the American Car Company.

South Bethlehem & Saucon Street Railway, Bethlehem, Pa., expects to purchase four open single truck cars.

Augusta-Aiken Railway, Augusta, Ga., has purchased eight Brill 21-E trucks from The J. G. Brill Company.

Detroit (Mich.) United Railway has ordered from the General Electric Company 60 two-motor, 70-hp car equipments.

Ottawa Electric Railway, Ottawa, Ont., has ordered 18 cars of the pay-as-you-enter type from the Ottawa Car Company.

Hummelstown & Campbelltown Street Railway, Hershey, Pa., has purchased one 31-ft. baggage car from The J. G. Brill Company.

Marshalltown Light, Power & Railway Company, Marshalltown, Ia., has ordered two 21-E trucks from the American Car Company.

Western New York & Pennsylvania Traction Company, Olean, N. Y., has purchased two Brill 27-G1 trucks from The J. G. Brill Company.

La Crosse & Onalaska Street Railway, Onalaska, Wis., has ordered one 20-ft. closed car and one Brill 21-E truck from the American Car Company.

Smith, Kerry & Chace, Winnipeg, Man., are issuing specifications for the purchase of a motor car by the Board of Control. Bids will be received until March 3, 1911.

Frankford, Holmesburg & Tacony Street Railway, Tacony, Pa., has purchased two 33-ft. 4-in. semi-convertible pay-as-you-enter type car bodies and four 39-E trucks from The J. G. Brill Company.

Public Service Railway, Newark, N. J., has purchased from the General Electric Company 40 GE-216 commutating pole railway motors, 38 K-35 controllers and 140 air-brake equipments, with CP-27 compressors.

Chattanooga Railway & Light Company, Chattanooga, Tenn., has ordered two cable cars from the C. G. Kuhlman Company for use on the incline up Lookout Mountain. A new feature is that the cars will be equipped with full vestibules at both ends, these being entirely inclosed in glass for observation purposes.

Wilmington & Philadelphia Traction Company, Wilmington, Del., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 4, 1911, as having ordered 22 cars through J. G. White & Company, from The J. G. Brill Company, has specified the following details:

Type of car.semi-convertible	Hand brakes.....Ackley
Seating capacity.....36	Heating system,
Bolster centers, length,	Consol. 118W.
17 ft. 4 in.	Headlights....Elec. S. S. Co.
Length of body.....26 ft.	Journal boxes .....Brill
Over vestibule.....37 ft.	Motors .....West. 101-B.
Width over sills..7 ft. 10½ in.	Push button signal...buzzer
Over posts at belt..8 ft. 2 in.	Registers...International R5
Body .....wood	Roofs .....monitor deck
Interior trim .....cherry	Sanders .....Brill dumpit
Underframe .....metal	Sash fixtures .....Brill
Air brakes .....West.	Seats,
Bumpers...Brill angle iron	Heyw'd Bros. & Wakefield
Car trimmings .....bronze	Seating material .....cane
Center bearings .....Brill	Side bearings .....Brill
Couplers ....Brill radiating	Springs .....Brill
Curtain fixtures ...Forsythe	Step treads .....Brill
Curtain material...Pantasote	Trolley poles .....Nuttall
Destination signs,	Trucks .....Brill 39E
Hunter illuminated	Varnish .....Murphy
Fenders .....Phila.	Ventilators .....Perry
Gongs .....Dedenda	Wheels...Lobdell cast steel

Denver (Col.) City Tramway, noted in the ELECTRIC RAILWAY JOURNAL of Jan. 28, 1911, as having ordered 16 closed

cars and 25 trail cars from the Woeber Carriage Company, has specified the following details for the closed cars:

Length over all..43 ft. 10 in.	Heating system.Consolidated
Interior trim.....Oak	Motors 4 GE-58
Air brakes.....West.	Registers ..... Ohmer
Bumpers.Hedley anti-climber	Roofs ..... monitor
Couplers ..... Tomlinson	Seats.....H. & K. No. 11
Curtain fix....Curtain S. Co.	Step treads.....Mason
Curtain material...Pantasote	Trolley base.....U. S. 13
Fenders.....Rocky Mt.	Wheels.....30-in. cast iron
Gongs..... 14-in.	

For trail cars:

Length over all...38 ft. 1 in.	Roofs ..... arch
Air brakes .....West.	Step treads.....Mason
Bumpers.Hedley anti-climber	Trucks .....arch bar
Couplers..... Tomlinson	Wheels.....30-in. cast iron
Registers ..... Ohmer	

TRADE NOTES

Ackley Brake Company, New York, N. Y., has recently received orders for 100 Ackley adjustable brakes from several tramways in Japan.

Consolidated Car-Heating Company, New York, N. Y., reports that since its buzzer system was introduced about two years ago over 2000 cars have been equipped.

Pawling & Harnischfeger Company, Milwaukee, Wis., has opened a branch office at 533 Baronne Street, New Orleans, La., under the management of T. W. Waddell.

Cooper Heater Company, Carlisle, Pa., has established its main sales office at 29 Kenton Street, Dayton, Ohio, from which office all matters relating to sales and correspondence will be handled.

Nachod Signal Company, Philadelphia, Pa., has installed Nachod automatic signals on the Green Ridge Suburban line of the Scranton Railway. The signals are being tried out by the railway, with a view to putting them in use on the Moosic Lake line.

Whipple Supply Company, New York, N. Y., will equip the eight new cars of the Norfolk & Portsmouth Traction Company and the two new cars of the Norfolk City & Suburban Railway with light-weight, rolled steel section Hedley anti-climbers.

Langslow, Lamon Sales Company, Rochester, N. Y., has been incorporated with a capital of $50,000 to deal in and manufacture the Langslow pre-payment system and other similar devices for use at entrances to amusement parks and pleasure resorts.

H. R. Langslow Company, Rochester, N. Y., has recently been incorporated with a capital stock of $250,000 to manufacture the Langslow pre-payment system consisting of fare box and turnstile for electric railway cars, as recently described in these columns.

Nichols-Lintern Company, Cleveland, Ohio, has recently received an order from the Nashville Railway & Light Company, Nashville, Tenn., for 250 improved ventilators. This company also reports an increased demand for sand traps and valves from electric railways in the Western States.

McClintic-Marshall Construction Company, Pittsburgh, Pa., has opened an office in the Morris Building, Philadelphia, Pa., in charge of C. H. Chubbuck, contracting engineer. This company also has contracting offices at New York, Pittsburgh, St. Louis, Chicago, San Francisco and Columbus, Ohio.

Pennsylvania Railway Motor Company, Warren, Pa., has been incorporated in Pennsylvania by J. A. Viele, Frank M. Knapp, O. W. Ensworth and R. W. Brown, to make cars, engines, machinery and boilers, of which the Viele motor car will be the principal product. The company has been capitalized for $200,000.

Goldschmidt Thermit Company, New York, N. Y., has appointed Dr. E. A. Beck metallurgist of the company. Dr. Beck was formerly connected with the Crucible Steel Company of America. This company has also appointed H. D. Kelly traveling engineer. Mr. Kelly was formerly connected with the Chicago & North Western Railroad.

National Brake & Electric Company, Milwaukee, Wis., calls attention to a typographical error which appeared in its advertisement in the Electric Railway Journal of Feb. 4. The advertisement related to National air-brake equipments and read "125,000 equipments in use," whereas the statement should have been made as "Over 25,000 equipments in use." The publishers of this paper apologize to its readers and to the manufacturer for the error.

Linde Air Products Company, Buffalo, N. Y., manufacturers of oxy-acetylene welding apparatus, has increased its capital from $500,000 to $1,000,000. The company has secured two sites, one at North Trafford, Pa., the other at South Elizabeth, N. J., and will immediately start the construction of large factories, which, it is expected, will be completed by June, 1911. This company now has two factories in operation, one at Buffalo, N. Y., and the other at East Chicago, Ill.

United States Steel Products Company, New York, N. Y., has elected Eugene P. Thomas president of the company, to succeed James A. Farrell, who was recently elected president of the United States Steel Corporation. Mr. Thomas has had considerable experience in the steel trade, having been foreign representative of the American Steel & Wire Company, the Illinois Steel Company and the Lorain Steel Company from 1899 to the time when these companies were taken over by the United States Steel Corporation, at which time Mr. Thomas accepted a position with the company of which he is now president.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received an order from the Nikkon Gas & Electric Company, Nikkon, Japan, for one 200-kva rotary converter, designed for operation at 365 volts, two-phase, 60 cycles a.c. and 550 volts d.c.; two 125-kva oil-insulated self-cooling transformers and one three-panel switchboard. This company has also received an order from the Rio de Janeiro Tramway Light & Power Company for two 2500-kva, 3000 r.p.m., 6300-volt, three-phase, 50-cycle turbo-generators. The turbines, which will be equipped with No. 11 Leblanc condensers, have been ordered from the Westinghouse Machine Company.

Wonham, Sanger & Bates, New York, N. Y., report an order for the equipment of all the cars of the Montreal (Que.) Street Railway with "H-B" wheel guards. This railway experimented for several years with a sample guard and about one year ago equipped 50 cars. The installations proved so successful that as a result an order was given for the equipment of the 700 cars operated by this company. The order is considered a great compliment to the efficiency of these automatic guards, owing to the steep grades in Montreal and the consequent crowning of large masses of snow between the rails, sometimes to a height of 9 in. The company has also received orders from Galveston and Houston, Tex., for the equipment of all cars in both cities with "H-B" wheel guards.

ADVERTISING LITERATURE

Allis-Chalmers Company, Milwaukee, Wis., has issued bulletin No. 1445, illustrating and describing different styles of electric hoists.

Frank Ridlon Company, Boston, Mass., has published a catalog for February, 1911, giving a list of second-hand electrical machinery.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., has issued booklet No. 253, on the intercomm-phone systems.

Under-Feed Stoker Company of America, Chicago, Ill., has published the February, 1911, number of "Publicity Magazine," which is devoted to the interests of the Jones stoker. It contains views and a description of an installation of the Jones stoker at the power plant of the Toledo Railways & Light Company, and also analyses of coals mined in Maryland, Kentucky, Tennessee and West Virginia.

NEW PUBLICATION

Metal Statistics for 1911. American Metal Market & Daily Iron & Steel Report, New York. 50 cents.

The 1911 edition of this work contains all the important statistics covering the production, consumption and price movements of all metal and iron and steel products dating back in some cases as far as 1883. It should prove a valuable reference manual for large users of these metals.