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### Passenger Car Window Glass

One feature of a railway car upon which all passengers are qualified to pass judgment is the window design. This part of a car structure is worth a careful study when new equipments are being planned. The shape of the windows has a great deal to do with the impression a car creates upon those who see only the exterior, as well as those who ride within the car. Next in importance to the proper contour for a car window and the choosing

of the sash fixtures so that accidents may be minimized, is the choice of the glass. The cost of window glass is made up not only of the installation cost, but of the charges for maintenance occasioned by breakage. On the score of appearance also, glass should present a smooth, flat surface devoid of bubbles and irregularity. In general the window sash of high-class cars are glazed with coach glass, polished plate, or so-called "cylinder" glass. The experience of the Kansas City Railway & Light Company has tended greatly to favor the latter named grade of glass, and is mentioned here as illustrating the good results to be derived from careful observation of replacement materials and their costs. The records of this company for one year show that there were in operation cars with 10,000 sash containing cylinder glass 5/32 in. and 3/16 in. thick, and 9000 sash with AA coach glass. All these cars were in city service. During the year the cost of replacements of the 10,000 cylinder glass windows was only about 55 per cent of the cost of replacing the AA glass. It is stated that the original cost of the cylinder glass is about three times that of the coach glass, but that a considerable economy is shown when the cost of glass and labor for renewals is considered. It is the careful observation of such maintenance details as these that serves to place a repair shop on a basis for maintaining equipments in the best condition at a low expenditure.

### Submitting Samples of Car Painting

About this time of the year every large railway system begins overhauling its open summer cars, and the question arises of how much to spend on painting and varnishing. The cost of painting cars depends very largely on the methods employed. Some are much more expensive than others, and it is possible to spend as much as \$50 per car or as little as \$5. From a study of specifications alone, it is not easy for the executive officer who must decide on the expenditures to be made to determine what method will produce the best results for the least money. One large city system in the East solved this difficulty by taking four cars of the same type and same general conditions and repainting them with different methods. One car was scraped to the wood, all paint burned off and was completely repainted and varnished, giving it the appearance of a new car. This cost \$40. Another car had the paint freshened up with a paint cleaning compound and the varnished parts coated with a special oil mixture of about the same composition as ordinary varnish, but not boiled. This cost only \$5.50. The two other cars were partially repainted and varnished with different degrees of thoroughness. These four sample cars when completed were submitted to the general manager for a decision as to which method to adopt for the remaining cars. The

appearance of the car which cost only \$5.50 to refinish was so favorable that the cheap method will be followed this year in overhauling the several hundred open cars operated by this company. Without a sample before him, the general manager would have found it hard to believe that a car could be put in good condition, so far as painting was concerned, for such a small expense, and in this particular case the manager believed from his experience that there was not enough difference in durability between the two methods to warrant the additional cost. The practice of another road to test the durability of two different makes of varnish is to varnish half of the main panel of a car with one kind and half with the other. In this way both are subject to the same conditions, and the wearing qualities are very evident.

### Census Statistics of the Street Railway Industry

The electric railway industry is developing so rapidly that the Census Bureau did well to make quinquennial collection of the statistics, instead of waiting until ten years following the last report, or until 1912. The census, for which the preliminary figures are available this week, are for the year ended Dec. 31, 1907, and it is interesting to notice that they correspond closely to the unofficial figures published last August by this paper. The census figures for 1902 are also included in the table published this week. The most striking feature of the record is the large increase during the past five years in mileage, cars and earnings from operation. The latter, indeed, have grown 68.9 per cent in the five years, or practically 14 per cent per year, and during the year ended Dec. 31, 1907, reached the enormous total of \$418,187,858. This amount, however, includes the earnings from lighting and power service of those electric railway companies which are also engaged in the commercial lighting and power business, but is exclusive of income from securities owned, returns from investment in real estate not used for operation purposes, etc. The receipts from lighting and power in the 1902 report were something over \$7,000,000, and could probably be conservatively estimated during 1907 at about \$20,000,000. Deducting this amount from the earnings from operation quoted above, the earnings from purely railway operation would be slightly less than \$400,000,000. This is approximately one-fifth of the gross earnings from operation of the steam railroads of the country reporting to the Interstate Commerce Commission for the year ended June 30, 1906, and is equal approximately to four-fifths of the passenger revenue of these steam railroads.

It is interesting to note that during the past five years the operating expenses of the electric railway companies have increased practically 8 per cent more than the earnings from operation, or 76.6 per cent, instead of 68.9 per cent, and that taxes and fixed charges increased practically 10 per cent more than earnings from operation, so that the net income of the electric railway companies shows an increase of only 31.8 per cent, or less than half that of the gross, as compared with five years ago.

The capital stock outstanding has increased 59.5 per cent and the bonds outstanding 72.9 per cent during the five-year period, making the total outstanding capital liabilities \$3,774,772,096. This represents an increase of 59.5

per cent in capital stock and of 68.9 per cent in outstanding bonds, or the ratio of net income to capital stock outstanding during 1907 was practically only 2 per cent and the ratio of the increased net income to increased capital stock since 1902 was only 1.2 per cent. The table of averages gives some interesting figures in this connection, as it shows increases in salaries and wages paid of 73.5 per cent and 71 per cent, respectively. The wage earners, however, have gained per individual by this change more than the salaried employees, as their wages have increased 8.2 per cent, while the remuneration of the average salaried employee has advanced only 5.6 per cent.

Turning now to the statistics on physical equipment, the combined effect of consolidations and the development of long distance power transmission engineering is clearly indicated in the small increase, only 2.7 per cent, in the number of power stations, while the development of high-powered station apparatus is clearly shown in an increase of only 8.5 per cent in the number of steam and gas engines, but an increase of 92.2 per cent in their kilowatt capacity and 110.4 per cent in the kilowatt-hour output. The table also testifies in a striking way to the development in the direction of longer cars by the disproportionately low increase in the number of cars and car-miles compared with that of passengers carried, and to the rapid extension of the use of transfers since 1902 in the ratio between increase of fare passengers and of transfer passengers.

### Preventing Mechanical Failures of Motors

In the efforts of many master mechanics to avoid electrical defects in railway motors on the street it sometimes happens that the mechanical side of motor adjustment is overlooked. There are few more aggravating troubles than those which block the line for many minutes at a time, and the cost of a mechanical failure often runs far above the expense of the shop repairs. As a rule an electrical trouble in a railway motor operating in regular service does not mean the same danger to passengers that is liable to be present in a mechanical failure. It may be spectacular and the cause of annoying damage suits, but in the majority of cases, probably, the mechanical failures are to be more dreaded. A short circuit in an armature, a grounded field or commutator or a burned-out lead is rarely capable of injuring any one's person, whereas a serious derailment may follow such an accident as the dropping of a motor or lower shell from its suspension, to say nothing of the delay which ensues while the car is being put back on the line or otherwise placed in condition for removal.

Careful inspection in the car house will do much to forestall motor dropping. Too much care cannot be taken to make sure that all the bolts are tight and of the proper length before the car goes into service. In one recent case where the car-house force were certain that all the bolts were tight before the car went into service from the pit, it was found that there was just one bolt still in the motor after it dropped on the street, with the nut gone; the corresponding corner bolt was gone, and when the motor dropped it broke the hinge bolts. It is most important for motors to be provided with cotter pins and bolts of sufficient length are a necessity for reliable service. Simple

as these precautions are, their neglect opens the way to serious trouble for an operating company. Only less important from the standpoint of possible service interruptions are failures to keep the bearings suitably lubricated, hasty truck adjustments and the careless running of motor leads across sharp edges or against shifting metal surfaces.

### Cab Signals and Automatic Stops

An appendix to the annual report of the Interstate Commerce Commission sent to Congress last week reviews the work of the Block Signal and Train Control Board during the first year of its existence. The duties of this board of four signal experts who were appointed in July, 1907, embrace an investigation of block signals, automatic stops and cab signals and other devices designed to promote the safety of railway operation. So far, the board has confined itself to an investigation of some 371 devices of which 248 relate to signals and automatic stops. Out of 184 inventions which have been finally passed on only 12 signal and train-stopping devices have been found to possess sufficient merit to warrant the board in recommending an actual service trial. These figures are quoted here as showing in a concrete way the general lack of knowledge of the requirements of apparatus of this character on the part of inventors who waste their time, money and energy on developing impractical devices. While the object of the investigations of the board has been primarily to discover suitable safety devices applicable to steam railway operation, the report contains much of interest to electric railway managers. The fundamentals of safe operation of railway cars or trains are the same whether the motive power be steam or electricity.

One of the subjects discussed by the report and of special interest to electric railway managers relates to automatic train stops worked in connection with fixed visual signals, a safety device whose use has been confined to date entirely to electric subway and elevated railways. The efficiency of these stops has been satisfactorily demonstrated in such protected locations where they are not subject to the effects of heavy snow and frost and possible tampering by trespassers and where a very high maintenance and inspection cost is warranted by the dense traffic. The board does not consider the experience gained under these conditions, however, to be conclusive as to their efficiency in unprotected locations. In the existing installations of automatic stops, the assumption has been that the motorman would properly control the movement of his train in accordance with the signal indications and the automatic stop is only intended to come into play when for any cause the motorman is incapacitated; in this respect it has precisely the same function as the "dead man" on the controller handle. Motormen do not ordinarily have a companion in the cab as does the engineman of a steam locomotive and for this reason there is perhaps a stronger argument for the introduction of such devices on electric railways than on steam railways.

The object of a cab signal is entirely different from that of an automatic stop, though the two devices have been combined in most of the plans submitted by inventors to the board, since it is a simple matter to actuate a stop mechanism with the same control used for the cab signal.

Cab signals are intended primarily to give a prominent warning close at hand to the engineman or motorman of a dangerous condition of track ahead. If the warning is not heeded the stop comes into play. There are arguments for and against the use of cab signals. In bad weather when fixed visual signals alongside of the track may be obscured by snow or fog, an indication in the cab cannot be missed or mistaken. Under any conditions, the indications of a cab signal are more likely to be impressed on the mind of the motorman or engineman than those of an exterior fixed signal. They can be made to give both visible and audible warnings and are easily combined with an automatic stop mechanism. On the other hand, the place for the motorman to center his attention is on the track ahead. A cab signal is a temptation to close the windows and trust to the signal inside, which is not absolutely infallible. If the signal apparatus on a motor car or locomotive gets out of order and there are no fixed signals along the road the car or train must proceed under the protection of a flagman ahead. Cab-signal apparatus must be constructed on the same principles as any other signal mechanism, namely, that a failure of any part will result in a danger signal and not a false clear signal. One reason for rejecting many of the plans submitted to the board was that the inventors had violated this principle by using a normally open circuit. With an open circuit a failure of any part of the apparatus cannot be detected by a distinctive indication of the signal and may exist as a source of danger for a long time.

The use of "wireless" communication between the controlling circuit and the apparatus on the car is an interesting characteristic of an experimental installation of cab signals and automatic stops on the line of the Suburban Railroad Company in the outskirts of Chicago. A coherer is made part of a closed circuit on the car and this circuit is broken, giving a danger indication on the cab signal if the particles in the coherer cease to be held in contact by the effect of the Hertzian waves emanating from a continuous-line wire strung along the track.

In referring to the merits of automatic stops and cab signals the report of the board states that in Great Britain the cab signal is considered only as a convenience, while "in America, both cab signals and automatic stops have been proposed as safety devices purely and on the assumption that the vigilance of enginemen and motormen cannot be improved to the point of insuring a satisfactory degree of safety while using only the present visual signals."

Elsewhere in the report also, the authors refer to the evidently greater efficiency of British railway employees as compared with the men employed in similar positions by the railways of the United States.

The report concludes with a strong endorsement of telephone train dispatching as against telegraph dispatching with the Morse code. Several steam roads have adopted telephones for train dispatching during the past two years and their experience has been that telephones are as safe and convenient as the Morse-code telegraph. The contingent liability of indistinct or incorrect transmission of words and figures must be guarded against in both systems of communication by good training, discipline and by repeating back all messages.

**THE POWER SYSTEM OF THE ROCHESTER RAILWAY & LIGHT COMPANY**

The Genesee River has three falls and seven rapids within the corporate limits of Rochester, which is 7 miles south of Lake Ontario, into which the Genesee River flows. The water power thus available has long been utilized for manufacturing purposes and supplies a considerable part of the power required in the railway and lighting service of the Rochester Railway & Light Company. The company, however, is not dependent entirely on Genesee water power because it possesses several steam power stations and also receives about 4000 hp from Niagara Falls. The railways served by the power equipment of the company consist of the city system of Rochester with suburban branches to lake resorts on each side of the Genesee River and interurban lines to Sodus Point, 40 miles distant, and Canandaigua, 27 miles distant.

The water power furnished by the Genesee River at Rochester, while practically unlimited during a short season of the year, falls to so low a point during other portions of the year that it is only possible at times to get enough water from Brown's Race to run the condensers for the engines. Water storage on the Genesee River has been discussed from time to time; but thus far nothing has been done. The New York State Water Supply Commission in its report just issued has recommended the erection of a storage dam capable of holding 18,000,000 cu. ft. of water at Portageville, N. Y. This amount has been estimated to be sufficient to provide a yearly average flow of 800 cu. ft. of water per second for power purposes and will increase by nearly 20,000 the actual 24-hour horse-power now developed at Rochester. Inasmuch as the scheme of poundage at Portageville will cost in the neighborhood of \$10,000,000, which would be apportioned among the benefited districts, there is little likelihood of the plant being carried through for at least some time to come. It is necessary therefore for the Rochester Railway & Light Company to keep some steam-driven stations in operation.

A list of the generating stations and substations at present operated by the Rochester Railway & Light Company follows:

Station	Location	Power	Generating or Substation
A	Mill & Commerce Sts.	Steam	Generating
B	Upper Falls	Steam and water	Generating
C	Brown's Race	Steam, water and battery	Generating
D	Upper Falls	Water	Generating
E	Lower Falls	Water	Generating
F	Johnson & Seymour Race	Water and battery	Generating
G	Middle Falls	Water	Generating
H	Carroll & Fitzhugh Race	Water	Generating
I	Brighton, N. Y.		Substation
J	Barge Canal, Greece, N. Y.		Substation
K	Portable station		Substation
L	Charlotte, N. Y.	Steam and battery	Gen. and sub.
M	Penfield, N. Y.	Steam	Gen. and sub.
N	Ontario, N. Y.		Substation
O	Sodus, N. Y.		Substation
P	Webster, N. Y.	Battery	Substation
R	Williamson, N. Y.	Battery	Substation
R	Charlotte, N. Y.		Substation
S	Dispatch, N. Y.	Water	Gen. and sub.
T	Pittsford, N. Y.		Substation
U	Victor, N. Y.		Substation
V	Canandaigua, N. Y.	Steam	Gen. and sub.
W	Gates, N. Y.		Substation
X	Littleville, N. Y.	Water	Gen. and sub.

The Brown's Race station, known also as station No. 3, is the largest of the combination stations of the company and is the subject of this article. It is located at about the geographical center of the city.

**GENERAL ARRANGEMENT**

The station is built on the westerly bank of the Genesee River against the rocky cliff. The solid rock extending from the race on the west at an elevation of about 100 ft. above

low water was channeled down to about a grade of 58 ft. for the main floor of the boiler room. Below this for a distance of 10 ft. is a basement for the ash hoppers and ash troughs, while toward the river there is another step cut in the rock 30 ft. below the boiler room basement for the engine room. The latter room has mezzanine floors on either side which support steam piping, condensers and other auxiliary apparatus. The engine room proper is approximately 76 ft. square inside of the columns supporting the galleries and is spanned by an electric traveling crane of 35 tons capacity. The engines are set in two lines running north and south with the shafts running east and west, leaving a 10-ft. aisle between the two rows of machines.

**ROOF AND COAL BUNKERS**

The roof of the boiler room is slightly higher than the street and between the building and the street runs Brown's Race, which comes within 10 ft. of the southerly end of the building. A bridge spans the race and over this all the coal and other fuel used in the station is passed. The boiler room is approximately 89 ft. x 69 ft. in the clear. Above the boilers is a coal pocket which is 21 ft. wide at the bottom with sides sloping at 45 deg. and 17½ ft. high to the bottom of the boiler house roof beams. The boiler fronts, stokers, concrete ash hoppers and part of the side walls of the boilers are supported by the main boiler room floor, but the boiler drums and tube sections are hung from pairs of 15-in. I-beams which frame into the horizontal coal-pocket girders. The roof over the boiler house is made sufficiently strong to support coal wagons which dump directly into the 1300-ton coal pocket through any one of 18 coal holes. The pocket is filled without trimming by hand by this means. The bridge forming a runway over the race has a 5 per cent grade so that teams have no difficulty in delivering the coal to the roof. One of the views shows the runway leading from the roof of the station and also illustrates the cable runway to a cable tower on the west side of the race. Over the latter runway many of the cables leaving the station are taken to underground conduits.

**STACKS**

The foundations for the stacks are also in the boiler house roof. The stacks themselves are 178 ft. above the base or foundation girders and are 10 ft. 3 in. in diameter. For 20 ft. above the base they are lined with firebrick. The stacks stand 41 ft. center to center, and their tops are approximately 185 ft. above the furnace grates. The up-takes from the boilers go directly upward into the bottom of the flue which extends the length of the boiler house on each side and discharges into the bottom of the stacks near the center of the station.

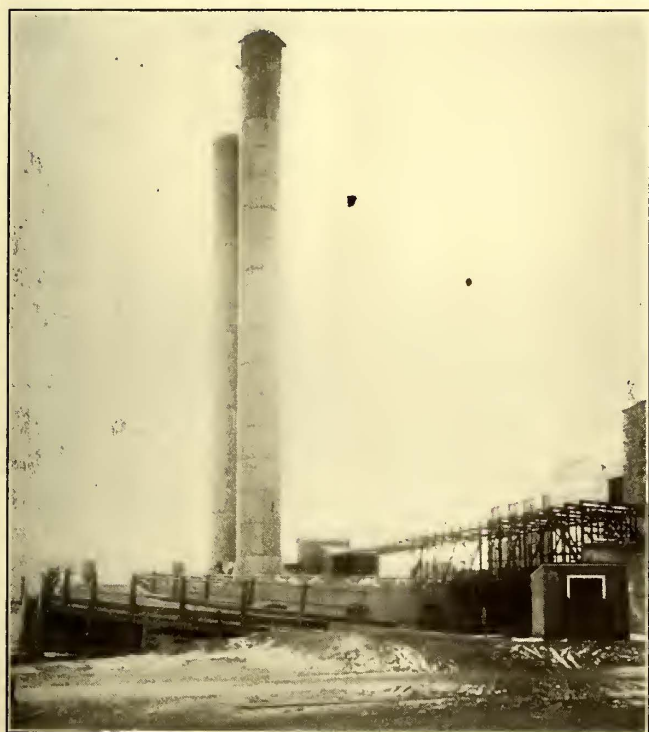
**BOILERS**

The boiler equipment comprises 10 Aultman & Taylor water-tube boilers, each of which is rated at 650 hp. The boilers are set in four batteries of two each occupying the four corners of the boiler house, with a single boiler set in the center of either side occupying the space immediately under the stacks. The boilers are set with no space behind them, cleaning doors being provided at the side instead of in the back. Two of the boilers are at present equipped for burning fuel oil and the others are fitted with Ross stokers made by the Harrisburg Foundry & Machine Works. Experiments made during the past year have caused the company to decide on a change in the boiler layout. The four boilers fitted with Ross stokers of the older type will have their furnaces changed. The

firebox will be lowered 7 ft. into the basement, leaving a combustion chamber above the grates of the stoker and the bottom tubes approximately 12 ft. high and 5 ft. deep, the setting otherwise remaining the same. The boiler front from the stoker to the lower tubes will be lined with firebrick and the bridge wall will, of course, be carried down to the bottom of the stoker pit. There is also an inclined firebrick arch over the coking grates which continues a suitable distance over the incandescent fuel. This serves as a sort of retort for coking the fuel, and the gases being completely burned in the combustion chamber, there is an absence of smoke. The effect of this deepened chamber is somewhat similar to that of a Dutch oven, and after trying the scheme out on one boiler the company is so pleased with the results that the change in the others will be made shortly.

#### OIL BURNING

Other experiments made with oil as fuel have caused the company to decide to equip four boilers for burning fuel, but the exact form of setting has not been decided



Rochester Power System—Stacks of Station No. 3, Showing Runway to Roof of Station

on as yet. Texas crude oil will be used. The oil is brought in cars and from the latter flows by gravity to a 750,000-gal. tank standing 90 ft. below the track level. An auxiliary tank 10 ft. below the track level feeds directly to the boilers, so that the oil will run from the cars to the storage tank and thence be pumped to the auxiliary tank. The oil can also be pumped from the storage tank. So far as cost is concerned experiments indicate that considering the cost of coal alone and the cost of oil alone, it is more expensive to use the oil. From the viewpoint of upkeep, however, including labor, it is estimated that the oil will show a small saving. The chief advantage of the scheme, however, is the absence of smoke, the ease of operation and above all the rapidity with which the boilers can be made to generate steam starting with the boilers cold. The two remaining boilers are fitted with the improved type of Ross stoker and these will not be changed.

#### BOILER OPERATION

A very interesting change will be made, however, in the flues and method of running the boilers. Considering one row of boilers and numbering these 1, 2, 3, 4 and 5, boilers No. 1 and No. 5 will have depressed furnaces, boilers No. 2 and No. 4 will be fitted for oil burning and boiler No. 3 will remain unchanged. The coal-burning boilers will carry the steady load and the gases will be constrained to pass from boilers No. 1 and No. 5 through boilers No. 2 and No. 4 and out through boiler No. 5 to the stack. If it is necessary to employ a fan to obtain the necessary draft in view of the circuitous route of the gases, a fan will be installed. Normally the oil-burning boilers will not be operating only on varying load and at peaks. The boilers will therefore act as sort of economizers and the arrangement will in all probability result in the generation of low-pressure steam at least. In cases of emergency the oil-burning boilers can be brought into use at once and steam generated in about 20 minutes.

The Ross stoker is designed for burning bituminous coal such as is used at Rochester and which costs about \$2.50 per ton. After the fuel leaves the coking plate and grates it passes down the inclined grates, each alternate bar being arranged to rise at the lower end and move forward, breaking up and carrying the fuel downward toward the dump grate at the bottom, making a constant and positive feed at all times. Separate adjustments control the movements of the coal pusher, coking grates and inclined grates which are all independent. A series of small coking grates are hung from a rocking bar and arranged to move forward and backward in a horizontal direction. Their function is to carry the coal and coke from the dead plate to the main inclined grates. The latter are alternately movable and stationary. The movable grates are controlled by a regulator on the front of the stoker and move to a height of 4 in. upward and forward at the lower end and then backward level with the stationary grates. They are straight from the upper end to the dump grates and provided with overlapping and vertical flights on their sides so arranged that a suitable supply of air will pass between them. The dumping ash grate is balanced and reversible and is operated by levers in front.

#### ENGINE ROOM

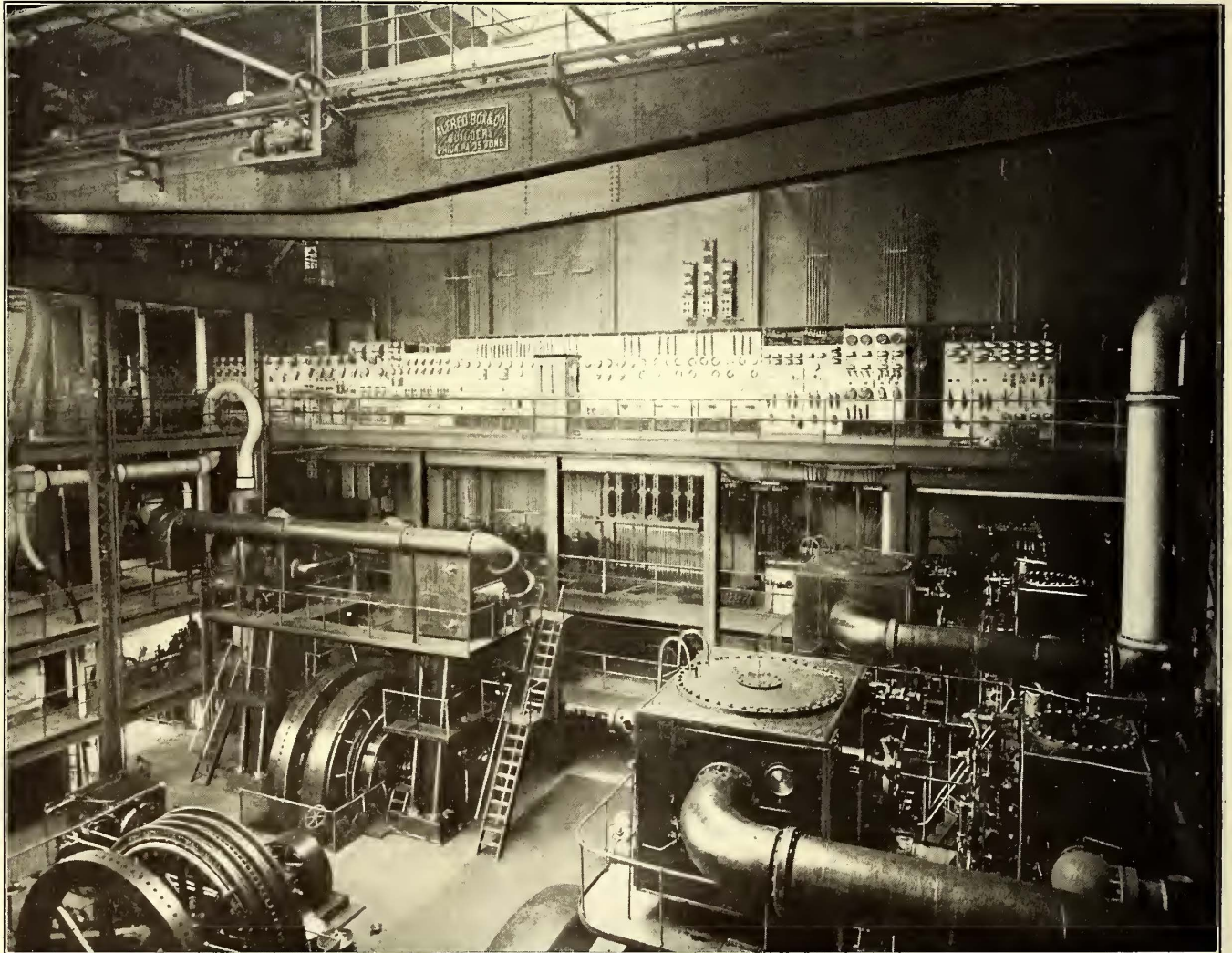
The engine room, a view of which is shown, is some distance above the river and has mezzanine floors on the east and west sides 6 ft. 10 in. wide. The first two mezzanine floors are on the same level with the engine platforms, the third mezzanine floor is on the same level as the main electrical control floor and carries the primary and secondary feed-water heaters, and the fourth mezzanine floor is 6 in. below the top of the crane girders.

Along the west side of the engine room are three vertical cross-compound engines built by the Southwark Foundry & Machine Company, of Philadelphia. Each engine is arranged to drive a 1360-kw, 4150-volt, 60-cycle alternator placed between the low-pressure side of the engine and an outer pedestal. The engines are designed to run at a normal speed of 90 r.p.m. with an initial steam pressure of 160 lb. and a vacuum of 26 in. Under these conditions each engine will develop 1800 hp at 30 per cent cut-off and a maximum of 3000 hp. When running with most economical load they require less than 13 lb. of dry steam per ihp per hour, including the steam used in the reheater, while the steam variation from no load to full load does not exceed 3 per cent from the normal. Under any change of load the speed variation is said not to exceed one-fourth

of one geometrical degree from the position of uniform rotation. The flywheel of each engine is 20 ft. in diameter and weighs with the armature sleeve close to 125,000 lb. The engines are fitted with Porter-type governors capable of electrical control from the switchboard for synchronizing purposes. A Bulkley condenser is provided with each of the three engines. The usual automatic free exhaust valve and connections are placed in each of the exhaust pipes and two Hoppes open heaters with 1750 ft. of scale-catching surface are connected to the engine exhaust pipe.

The feed-water is taken from the hot well, race, river or from the city water mains and is handled by three duplex outside-packed plunger pumps. These pumps are designed to work against 250 lb. water pressure and any

the foreground of the interior views having been removed and a turbine placed there instead. The engine near the switchboard galleries is an 1800-hp vertical cross-compound McIntosh & Seymour engine direct-connected to a 1000-kw railway generator. At the other end of the row is an 1800-hp Allis-Chalmers vertical, cross-compound engine direct-connected to two 550-kw, 250-volt generators. Between these engines is a 3000-kw Curtis turbine driving a 4150-volt, three-phase alternator. The latter unit is fitted with an Alberger condenser and the whole equipment requires less space than the old 500-kw set which has been placed in Station No. 1 for reserve use. The steam pipe arrangements on the east side of the station do not differ greatly from those on the other side.



Rochester Power System—General View of Engine Room of Station No. 3, Showing Switchboard Gallery

one is sufficiently large to handle the entire installation. From the pumps the feed-water is taken through the Hoppes heaters and thence into the feed mains which run underneath the boilers immediately in front of the ash hoppers, where connections are made to vertical lines at the side of the boiler. The steam pipe connections for the three Southwark engines are illustrated. The door shown on the upper mezzanine floor leads into the boiler room, being a few feet above the boiler room floor. The main steam header supplying the engines is shown directly below this door and the two feeders from the boiler room are shown coming down at either side of the door.

Along the east side of the engine room there are two engines and a steam turbine, the Dickson engine shown in

Normally when there is plenty of water in Brown's Race the condensing water is taken directly from the race without any pumping whatever, but during periods of slack water the condensing water is pumped from the river.

The station possesses many advantages because of its peculiar location. Although coal must be carted to it, after it is dumped into the pocket there is no rehandling, nor is there any moving machinery employed in its distribution. The coal is delivered by gravity through chutes to the hoppers of the stokers. The ashes are dumped into a concrete trough under the furnace pits in the basement whence they are washed into the river without further ado and the whole problem of ash removal easily solved. Boiler feed water must be pumped because the tops of the boilers are

not much below the level of the race and at times water for condensing purposes must also be pumped. Ordinarily, however, there is enough water in the race so that the condensers may be fed by gravity from it, or, in other words, a spillway with intercepting condensers is provided at this point instead of farther down the river, where no advantage could be taken of it.

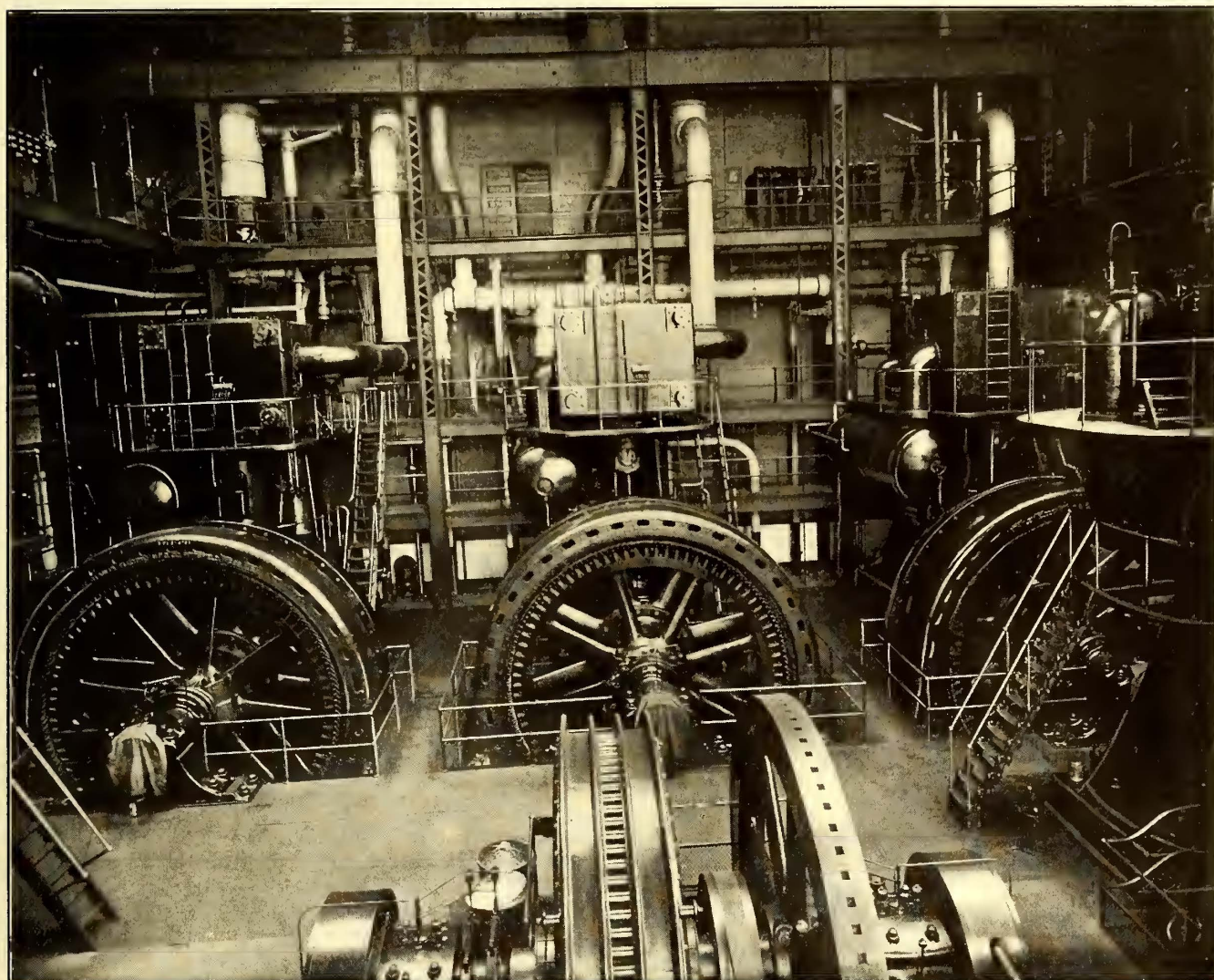
#### GENERATING APPARATUS

The generating apparatus in the station consists of three, 4150-volt, three-phase, 60-cycle alternators, one 3000-kw turbo-alternator, one 1000-kw, 550-volt generator and two 550-kw, 250-volt generators. The three engine-driven alternators are of Stanley type and all the other generating

railway battery for booster purposes and is arranged with carbon regulator. There are also in use for excitation purposes a 75-kw steam-driven set and an induction-motor exciter set. The steam-driven set is used so as to make the excitation independent of any electrical disturbance which might affect the regular operation of the system, and also on account of the relatively high economy realized by utilizing the exhaust steam to heat the boiler feed-water, as the station has no other steam auxiliaries except the boiler feed pumps, stoker engines and condenser pumps.

#### WATER POWER AUXILIARY

Adjacent to the steam plant of Station No. 3 is an old water power plant taking water from Brown's Race



Rochester Power System—View of Engines Along West Wall of Station No. 3, Showing Steam Piping

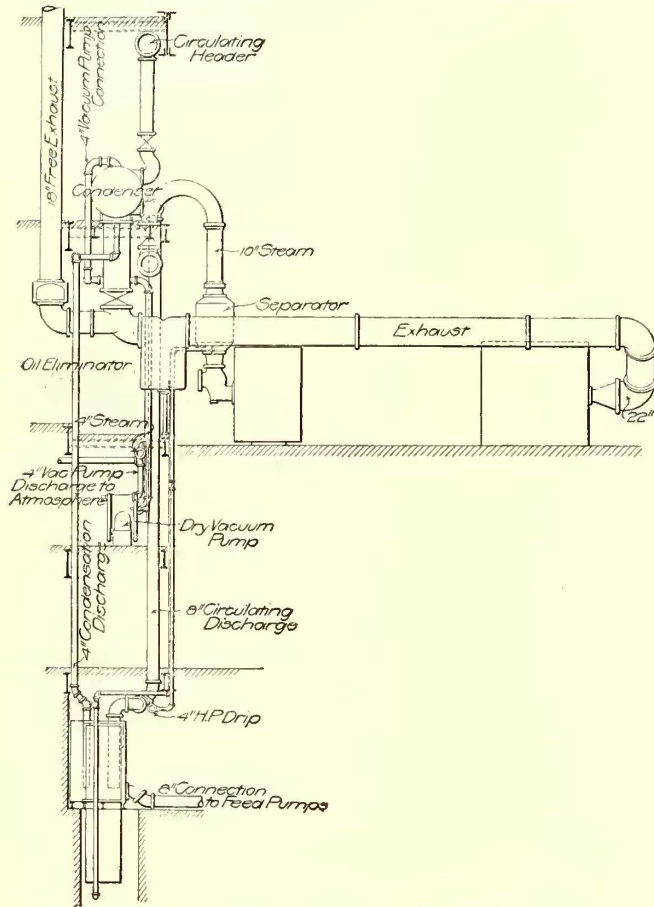
apparatus is of General Electric make. In addition there are two 250-kw, 550-volt Bullock motor-generator sets used to feed a 500-volt motor circuit, a 500-kw, 550-volt General Electric motor-generator set for street railway work, a 90-kw, 125-volt General Electric motor-generator set for excitation purposes, two 150-kw Edison machines direct coupled to a 250-volt Edison generator used as a motor, also for exciter purposes, a 1000-kw chloride battery for railway work, a 640-amp-hour battery floating on the exciter bus and capable of supplying the entire excitation energy required by the station for one hour, a 500-kw, 275-volt motor-generator set for feeding the Edison system at this point and a 125-hp motor direct connected to a generator. This last set is used in connection with the

through a 7-ft. penstock and having a head of about 90 ft. Heretofore the generators in this plant were driven from belts and ropes; but lately the plant has been reconstructed and direct-connected units have been installed. There are two 350-kw, 4150-volt alternators and one 300-kw, 550-volt, direct-current generator, which form the equipment of this plant.

#### SWITCHBOARD AND CONNECTIONS

At the south side of the engine room are three galleries set aside for electrical purposes. The two lower galleries are 12 ft. 6 in. wide and the one on which the switchboard is placed is about 16 ft. wide. An addition is built to the southeast corner of the engine room which extends the full height of the building, 18½ ft. x 43 ft. In this, switch-

board and transforming apparatus is installed. All the electrical connections of the generators, exciters, etc., are brought to the operating switchboard in the gallery. The board is somewhat different from that shown in the cut. Since the picture was taken the switchboard has been rebuilt to a large extent, although the general arrangement remains the same. There are now about 55 panels in the board comprising panels for the generators, motors, tie lines, battery, railway feeders, Edison system feeders, alternating-current feeders, etc. The railway circuits are controlled from the left end of the board. The panels are standard throughout, but the excellence of the wiring back of the panels is worthy of comment. The oil switches are located on the gallery below and the constant-current transformers for the series arc-lamp circuits fed from this station are placed in the gallery above and to the left. From this station there are several three-phase distributing feeders for lamp and motor circuits and on these circuits po-



Rochester Power System—Steam Pipe Connections to Large Engines in Station No. 3

tential regulators are arranged. These are placed back of the switchboard. The exciter circuits run directly from the machines to the bus in conduit. All wiring from the transformers to the switchboard is in conduit with outlet boxes at the bottom of the board for the relay connections and at the top for the instrument connections. Conduits are used for outlets and all the wiring being encased, the back of the board is singularly free from danger of contact. The motor-generator sets are located on the third gallery below the switchboard.

Station No. 3 being the main steam-generating station of the company, is electrically connected with many of the other stations through numerous tie lines. There are tie lines to Station No. 2 on the Upper Falls for both railway and Edison lighting circuits; alternating-current tie lines

with Station No. 15 on the Middle Falls, with Station No. 5 on the Lower Falls, with Stations No. 4 and No. 6 on the Upper Falls and on Johnson & Seymour Race, respectively, and there is also a tie line for railway circuits with Station No. 5. Inasmuch as the other stations are tied together, it is possible to transfer the load from almost any station to Station No. 3 and vice versa. The advantage of having the various stations electrically connected was well shown during the recent drought. Stations No. 2 and No. 3 and Station No. 1, which is usually only run in cases of emergency, are the only steam stations of the company. In the absence of water the first two were run overloaded for 24 hours a day during the season of drought and the last was run for two hours a day on the peak load. The tie connections are run underground, some passing out underground directly from the station and others crossing the river to the opposite bank.

### COMMITTEE OF RAILWAY COMMISSIONERS ON CONSTRUCTION AND OPERATING EXPENSE ACCOUNTS

Martin S. Decker, president of the National Association of Railway Commissioners, has issued a circular announcing the committees which will take up various subjects and report at the next annual convention, to be held at Washington, D. C., on Oct. 12, 1909. Among the committees appointed is one to take up the subject of "Construction and Operating Expenses of Electric Railways." This committee is composed of the following:

- Milo R. Maltbie, of New York.
- Francis M. Cockrell, of the Interstate Commerce Commission.
- William Kilpatrick, of Illinois.
- Halford Erickson, of Wisconsin.
- Charles E. Mann, of Massachusetts.
- Charles B. Riley, of Indiana.
- C. N. Duffy, of American Street & Interurban Railway Accountants' Association.

In commenting on the work before this committee and the committees appointed to consider the subjects of "Railroad Statistics," "Grade Crossings and Trespassing Upon Railroads" and "Safety Appliances," Mr. Decker indicates "that in addition to the usual reports there should be strong effort made to secure uniformity in so far as may be practicable, and these committees might well also work in harmony with the committee on legislation in that respect."

Mr. Decker states that the committee which is to report on the "Powers, Duties and Work of State Railway Commissions" should make a report showing all the State laws pertaining to regulations. Mr. Decker recommends that another committee make a full inquiry into the history of delays affecting orders of State commissions, resulting from injunction proceedings in Federal courts. He thinks that such an inquiry "would be highly valuable as supporting recommendations for provision of a remedy."

Regarding the work of the committee on capitalization Mr. Decker says:

This is a new standing committee. In view of the regulation of capitalization in some of the States and the declarations which have been made for Federal regulation upon that subject, it has become important that such a committee should be provided. The effect of overcapitalization or wrongful capitalization upon railway rates, railway service and railway improvements justifies the fullest inquiry by this committee into all phases of the subject, both as related to State and interstate railroad transportation and rates and the character and degree of capitalization regulation which is practicable and under all conditions to be desired.



## NEW YORK PUBLIC SERVICE COMMISSIONS REPORT TO LEGISLATURE

The Public Service Commissions of New York, First and Second Districts, have submitted reports to the State Legislature for the year ended Dec. 31, 1908. These reports relate to the work of the commissions and their decisions on various matters.

### FIRST DISTRICT COMMISSION REPORT

The report of the commission of the First District shows that the surface, elevated and subway companies in New York City carry annually over 1,300,000,000 passengers, which is over 66 per cent more than the total number of passengers carried on the steam railroads of the entire country. These companies have a capitalization of over \$533,000,000 and derive annually from their passengers over \$62,000,000. The gas and electric companies have a capitalization of over \$386,000,000 and the amount of gas sold annually is over 32,000,000 cu. ft., which is more than 20 per cent of the entire gas production in the United States. The income from the sale of electricity in New York is over \$20,000,000.

The report, after mentioning the recommendation of Bion J. Arnold that two trains of the Interborough Rapid Transit Company be equipped with side doors, says:

Mr. Arnold has made other important recommendations as to improvements in the construction and operation of the subway, which are now being considered. The purpose of the commission has been to utilize every possible method known to engineers to increase the carrying capacity of the subway and relieve congestion.

Following the recommendations of Mr. Arnold, the Interborough company was requested to install a new type of signal system on the express tracks, which, by a method of speed control, would allow express trains to approach stations by shorter blocks than had formerly been the practice. By this means, when a train is at the station the next train is held just outside of the station instead of in the next block; less time is therefore lost in the arrival of trains at the stations during rush hours and a larger number of trains can be operated. This system has been put into use at the Ninety-sixth Street station and is working so satisfactorily that the company is about to install it at other stations.

In referring to the systems of accounts the commission says it found that little work as to electric railroad and gas and electric companies "had been done other than by certain technical associations whose systems were not compulsory, nor had they been generally accepted because of considerable differences of opinion within the associations themselves."

An abstract of the part of the report which refers to equipment, appliances and service follows:

The commission has ordered the complete and thorough overhauling of all of the surface cars operated in the boroughs of Manhattan and the Bronx. As a result the noise and strain incident to the running of rattling cars with flat wheels has been enormously decreased, car efficiency has been increased, the appearance has been improved, the cost of operation decreased and the safety of the public better protected.

Because of complaints and because of lack of proper efficiency in the service the commission has had careful investigation made of the equipment in use throughout the district, and has found it necessary to order practically all of the cars either to be completely overhauled or to be improved in certain specified particulars.

The enormous number of accidents reaching nearly 50,000 in a year, and including nearly 600 persons killed, called striking attention to the lack of safety devices, and the commission has conducted extensive and satisfactory

tests of fenders and wheel guards, open to all manufacturers in this country and abroad, to determine what ought to be done to save life. This work was completed just before the end of the year.

The commission will now, following proper notices to the companies and after hearings, require the installation on the cars of fenders and wheel guards that have met the tests of the commission satisfactorily.

Another matter to be taken up immediately will be the proper types of brakes. Use of proper safety devices and brakes will, it is anticipated, decrease very largely the number of serious accidents. The next largest class of accidents arises from the fault of employees of the roads, such as overspeeding and apparent lack of proper instruction. This cause is perhaps more difficult to eliminate because of the human element involved, but its importance is unquestioned.

The commission found in its examination of equipment, particularly new equipment about to be purchased by the companies, that it was advisable, and ordered, that the companies should file specifications in advance of purchases. By this means it has been possible to point out important defects before equipment was completed, and at a time when their elimination was less expensive to the companies than after the cars were put in use. As a matter of legal authority the commission probably does not have the power to compel a company to make any change in its equipment until the equipment is put in public use. In European countries the possession of this power by the boards exercising State supervision over public services requires the approval of general plans of equipment before being purchased and has been very satisfactory.

The commission may require by order increases in service under the provisions of the act that companies shall furnish adequate service and shall have sufficient cars and motive power to meet any requirements of transportation that may be reasonably anticipated. The problem presented, however, of defining what will be regarded as adequate service is shown by the fact that in the year 1907, disregarding the number of transfers, there were carried on the roads of New York City 66,000,000 more fare passengers than in the year 1906. As an average, this means that there were 180,000 more passengers each day during the year than on the day before. It is not to be wondered at that, with the increase in the number of passengers incident to the growth of a great city, any increase in car service ordered by the commission is not readily apparent to the traveling public, yet a relatively greater amount of the time of the commissioners is taken up with consideration of increases in service than with any of their other important duties.

The commission has endeavored to increase the efficiency of service by requiring improvements in equipment. It has studied street congestion and attempted to have routes so changed as to avoid the limiting points of capacity. It has also insisted that the rush-hour service shall begin earlier and be continued later than has been customary.

The commission has decided that transportation companies should run as many cars as it is physically possible to operate during rush hours, that the number of seats should equal if not exceed the number of passengers in a short period of time, and that the only excuse for not providing such service shall be insuperable physical conditions or events which it is impossible to foresee.

### SECOND DISTRICT COMMISSION REPORT

At the close of the year 854 corporations, municipalities and individuals were engaged in some public service that by operation of law placed them under the jurisdiction of the commission; of this number 141 were street railroad corporations, divided as follows: Operating, 80; not operating, either inchoate or dormant, 44; not operating, lessor, 17.

The number of persons in the employ of the commission at the end of the year was 88. The total number of complaints received during the year was 1399, of which 1147 were correspondence complaints, being made the subject of correspondence with the corporations against which the

complaint was made, while 252 were formal complaints to which answers were required.

#### CAPITALIZATION

The commission summarizes the chief decisions made on this subject, saying in part:

In three cases it was held that the use of capital to be secured by the issue of stock, bonds, or other evidence of indebtedness must be necessary for one or more of the four purposes specified in each of sections 55 and 69; that the amount authorized is reasonably required for one or more of said purposes. In other words, that an enumeration of purposes for which stock, bonds and other evidence of indebtedness may be issued is exclusive and not inclusive; that the stock and bonds may not be issued for purposes not enumerated in the statute, either with or without the authorization of the commission.

Pursuant to the principle thus enunciated, it was held in the case of the application of the Erie Railroad that a scrip dividend, and in the case of the application of the Babylon Electric Light Company, that a stock dividend is not one of such purposes; and in the case of the Lehigh & Hudson River Railway Company, that the reimbursing of a treasury for previous payments made for one of the purposes named in the statute is not one of such purposes. No capital whatever is secured to the company by the proposed issue of stock or scrip; and moneys secured by bond issues for the so-called reimbursement of the treasury could be expended for any lawful purpose, although not one of the purposes named in sections 55 and 69, whereas the statute plainly requires that they must be expended for one of those purposes only and must be reasonably required therefor.

In the application of the Newburgh Light, Heat & Power Company the commission denied the application for authorization of preferred stock to the amount of \$250,000, entitled to a cumulative annual dividend of 8 per cent, holding that the condition of the money market taken in connection with the physical condition of the applicant corporation did not justify a fixed charge of this amount.

In the application of the Watertown Light & Power Company for authorization of an increase of its capital stock and bonded indebtedness, it was suggested to the commission by the corporation counsel of the city appearing in opposition to the application that the existing capitalization of the applicant was excessive and that for this reason the application should be denied as tending to increase an unwarranted capitalization. The commission adopted, unanimously, certain propositions as follows: (a) That it will not investigate or inquire into the correctness of the capitalization of the Watertown Light & Power Company authorized by the former Commission of Gas & Electricity; and therefore will not inquire in this proceeding into any alleged overcapitalization of the applicant existing at the time the application was made; (b) that the investigation upon this application for additional capitalization will be confined to the question whether such capitalization should be authorized by reason of the actual investment of the money to be secured thereby for the purposes of the corporation recognized by law as a subject of capitalization. The question was presented whether the commission might authorize the applicant to issue bonds to acquire money with which to make expenditures on property not presently necessary in the discharge of the public service functions of the corporation. It was held that public service corporations may be authorized to make expenditures incidentally for purposes other than public service, if such expenditures are on property to be used ultimately and properly for such public service.

An interesting question early presented itself to the commission as to what extent the investing public might be justified in relying upon the authorization given by the commission as an implied certificate that the bonds or stock to be issued were worth their face value or any other amount. It was obvious that the practice of the commission in carefully investigating the purposes for which bonds or stock were to be issued, and passing upon the necessity of the sum to be secured by such issue in carrying out said purposes, would create a feeling upon the part of some that such investigations could be relied upon as establish-

ing the value of the securities. This identical question arose upon the application of the Hudson River Electric Power Company, decided Dec. 4, 1907, for leave to issue bonds to the amount of \$3,232,000. Upon this point the commission said:

"In passing upon the application for leave to issue additional capital stock, the commission will consider:

"(5) Whether there is reasonable prospect of fair return upon the investment proposed, to the end that securities having apparent worth but actually little or no value may not be issued with our sanction.

"We think that to a reasonable extent the interests of the investing public should be considered by us in passing upon these applications.

"The commission should satisfy itself that, in a general way, the venture will be likely to prove commercially feasible, but it should not undertake to reach and announce a definite conclusion that the new construction or improvement actually constitutes a safe or attractive basis for investment. Commercial enterprises depend for their success upon so many conditions which cannot be foreseen or reckoned with in advance, that the duty of the commission is discharged as to applications of this character when it has satisfied itself that the contemplated purpose is a fair business proposition."

So in the case of the Watertown Light & Power Company the commission held that the purchasers of securities authorized by it are not exempt from the business risks involved in the possibility of the corporation issuing the securities being overcapitalized.

In a series of applications arising out of the desire of the Lockport Light, Heat & Power Company, a new corporation, to purchase the property and franchises of two existing and competing gas and electrical corporations, decided Oct. 31, 1907, it was held that a sale of the property and franchises of two gas or electrical corporations to a third is virtually a consolidation and is subject to the section of the law, providing that the capital stock of a corporation formed by the merger or consolidation of two or more other corporations shall not exceed the capital stock of the corporations so consolidated at the par value thereof, or such sum and any additional sum actually paid in cash. Various conditions were imposed upon the consummation of the desired purchase, which conditions were accepted by the applicants.

The application of the Elmira, Corning & Waverly Railway, decided July 23, 1908, was for an authorization to issue bonds of the applicant in exchange for the stocks of other railroad corporations. The question involved was whether authorization should be given to issue bonds for such purpose, but such question was not directly passed upon by the commission. The application was denied upon the ground that the fair value of the stocks proposed to be purchased was not equal to the par value of the bonds proposed to be issued, leaving the question unsolved whether the purchase of stocks of other railroad corporations was within the fair purview of the language "when necessary for the acquisition of property," as used in section 55.

The application of the Rochester-Corning-Elmira Traction Company, decided March 30, 1908, was the first case brought before the commission involving the capitalization to be authorized in the case of a new street railroad corporation. The following expresses the conclusions laid down by the commission in that case as the basis of its determination:

"Upon application for capitalization of a newly organized railroad company the proceeds of such capitalization to be used for constructing and putting in operation its railroad:

"5. Proof will be required showing in careful detail the probable cost of the physical construction and equipment of the road.

"6. In addition to estimates of the physical cost, proof should be given touching the following matters which enter into the expense of launching the enterprise: (a) expense of organization; (b) incorporation tax; (c) expense of obtaining certificate of public convenience and a necessity; (d) preliminary engineering expenses; (e) expense of proceedings to procure authorization of issue of stock and bonds; (f) expense of marketing securities; (g) dis-

count upon bonds, provided they cannot be sold at par; (h) interest upon the bond issue during the period of construction and prior to the beginning of revenue producing operations; (i) compensation of officers during the construction period; (j) incidental expenses during construction period; (k) expense of obtaining local franchise and consents.

"7. An allowance will be made for a proper amount of working capital to be determined by the extent of the proper operations.

"8. A fair allowance will be made for services in promoting the organization of the enterprise. Such allowance will be placed upon the basis of just payments for valuable and indispensable services.

"The division of the capitalization between stock and bonds will be determined in substantially the following manner whenever the same is practicable:

"9. An estimate will be made from consideration of the results of operation of existing roads of the probable gross earnings.

"10. An estimate will be made in like manner of the probable operating expenses, taxes and depreciation charges.

"11. The excess of earnings over the disbursements which must be made before fixed charges can be met represents the sum which is applicable to fixed charges.

"12. The maximum bond issue which will be allowed must be determined by the sum thus ascertained to be applicable to the payment of the interest charge.

"13. No bond issue should be permitted creating an interest charge beyond an amount which it is reasonably certain can be met from the net earnings.

"14. Stock representing a cash investment should be required to an amount sufficient to afford a moral guaranty that in the judgment of those investing the enterprise is likely to prove commercially successful.

"The order authorizing such stock and bond issues will contain appropriate provisions designed to secure the construction of the road in accordance with the plans and specifications upon which the authorization was made and not in excess of the actual requirements.

"If the allowance proves inadequate for the required purposes, an application for further capitalization may be made, upon which application the expenditure of the proceeds of stock and bonds already authorized must be shown in detail."

In the case of an authorization of stocks, bonds, notes or other evidence of indebtedness for the payment of interest obligations, the language of the statute is that the corporations under the authorization of the commission "may issue, stocks, bonds, notes or other evidence of indebtedness payable at periods of more than 12 months after the date thereof when necessary for the discharge or lawful refunding of its obligations." In the application of the Lehigh & Hudson River Railway, decided May 7, 1908, the commission held:

"Upon application for an order of authorization under these sections (55 and 69) the proposed use of the capital to be secured being the discharge or lawful refunding of obligations of the applicant, inquiry will be made as to the consideration of such obligations and the use to which such consideration was put, with a view to ascertaining whether such obligations are proper subjects of capitalization."

The commission in this case did not go into the subject extensively, but contented itself with calling attention in a general way to the point that the purpose for which the obligation was incurred could properly be considered upon an application to issue bonds in payment therefor.

In the application of the Delaware & Hudson Company for authorization to issue bonds, the point was again presented more directly. The company sought to issue bonds for the purpose of refunding outstanding obligations. The commission held that it may properly and lawfully deny an application for a bond issue, the proceeds of which are proposed to be devoted to the discharge or refunding of a conceded lawful indebtedness of a definite amount, as a matter of wise discretion. That one factor upon which such discretion may be based is the purpose for which the indebtedness was incurred. It was held that

a bond issue which creates an annual charge upon railroad properties for purposes unconnected with those properties tends to limit the amount annually available from income for the proper management and betterment of such properties, and that a lien upon such properties for the principal sum limits by the amount of such principal sum the credit of the corporation in borrowing upon their security sums which may be necessary from time to time for their improvement and extension.

The foregoing review shows that the commission stands firmly upon two propositions: First, that it has no power to authorize the issue of stocks, bonds or other evidence of indebtedness except for one or more of the purposes enumerated in sections 55 and 69 of the Public Service Commission Law; second, that within the limits of those purposes it has a very wide discretion as to the purposes and all of the details of the proposed issue; that this discretion is to be controlled by sound general principles of universal application. While no formal decision has been rendered as to the extent the commission will undertake to control the discretion of boards of directors, its undeviating practice is not to interfere with that discretion unless its exercise is deemed to be clearly unwise and prejudicial to public interests by reason of its infringing upon some general principle essential to the public welfare. In other words, the denial of an application of this character imposes upon the commission the burden of pointing out clearly and conclusively wherein the granting of the same would be improper or unwise.

The practice of the commission is to require that stocks shall, in conformity to law, be issued for cash, at the par value thereof; or if they are issued for property or service, it requires satisfactory proof as to the value of such property or service, to the end that the stock shall not be issued for less than the true cash value of such property or service. Bonds are permitted to be issued with reference to actual market conditions and the value of money. Two forms of order are used: One in which, if the company desires to issue bonds at less than their par value, a contract for the sale of the same must be reported to the commission and approved; in the other, a minimum price is fixed below which the bonds cannot be sold, leaving the company at liberty to sell the same at that price or at such better price as it can obtain in the market.

Attention should be especially directed to the practice of the commission upon certain points of great importance, additional to that of discount allowed upon a sale of bonds. As shown above, it was determined in the Rochester-Corning-Elmira Traction Company case that an allowance will be made for a proper amount of working capital, to be determined by the extent of the proper operations of the corporation, and that a fair allowance will be made for services in promoting the organization of the enterprise. Such allowance will be placed upon the basis of just payments for valuable and indispensable services.

In these three matters of discount on bonds, working capital and allowance for promotion or services, the practice is understood to be different from that prevailing in Massachusetts. Since 1894 commissions in that State have had control of the amount of securities that public service corporations can issue for any and all purposes. The statutes under which they act are in many respects similar to the Public Service Commissions Law, in this particular: Railroads and street railroads must apply to the railroad commission; gas and electric light corporations, to the gas and electric light commission, and telephone and telegraph, aqueduct and water companies to the commissioner of corporations. Both the railroad and the gas and electric light commissions refuse to permit securities to be issued for discount on bonds. It is understood that the railroad commission apparently disapproves of an issue of stock or bonds to provide working capital, but that the gas and electric light commission permits this item to be included in a company's original capitalization.

The commission has not found occasion to doubt the correctness of its conclusions upon these points. It has endeavored, and will continue to endeavor, to make its rulings such as to encourage the investment of capital and the promotion of enterprise. The interests of the public imperatively demand these results, and the commission believes

that they are not in the slightest degree inconsistent with the protection of the public against those practices which have justly earned the condemnation of the public and led to the regulation of corporate capitalization by law.

#### UNIFORM SYSTEMS OF ACCOUNTS

The commission says that the form of accounts is intimately, and perhaps inseparably, connected with the subject of capitalization, and adds:

The law subjects these corporations to regulation and control as to capitalization, service and rates. No supervision over these matters can be efficient or just without full knowledge of the corporation's affairs. No complete understanding of such affairs can be attained without comparison with the like affairs of other corporations. Determinations as to rates and service necessarily involve considerations of cost. It is not practicable nor even possible to have intelligent investigation of the affairs of the large number of corporations subject to the provisions of the Public Service Commissions Law without uniformity in the accounts of the various classes of such corporations. In its work up to this time the commission has been considerably embarrassed by the fact that the statistics available for its use have, in many cases, been useless because not based upon uniform systems of accounts.

Attention is especially called to the fact that in the preparation of these systems of accounts the commission has kept in constant touch with the corporations themselves, has invited and profited by constant comment and criticism, and has endeavored in every way to make the bookkeeping it prescribes practical as well as theoretically correct.

The work of preparing these systems of accounts has been entrusted to William J. Meyers, statistician to the commission, and to him should be awarded the credit of their technical excellence and perfection of form.

Electrical corporations and street railroad corporations are in the present stage of the arts very closely related. Because of this close relationship, and because of the necessity for basing the accounts for all public service corporations upon the same fundamental principles, it was considered advisable not to crystallize the scheme for any one class of corporations in advance of a general settlement of the scheme for other classes.

Throughout the various schemes of accounts, uniformity has been sought for whenever it seemed to be practicable to obtain it. It has been recognized, however, that to attempt to secure uniformity of accounting where uniformity of fact does not exist, is to abandon the substance for the form, and there has been no attempt to push uniformity to such lengths as to secure merely specious results. Each scheme recognizes the division of capital into fixed capital and floating capital; that in fixed capital, wherever different classes of corporations have similar classes of fixed capital, similar accounts have been prescribed in respect thereof; that floating capital is subdivided into materials and supplies on the one hand and current assets on the other, and that like accounts for current assets have been prescribed; as have like accounts for investments, prepayments, suspense and other matters usually appearing on the debit side of the balance sheet; and for funded debt, unfunded debt, reserves and other matters usually appearing on the credit side of the balance sheet. With regard to the income accounts, it has not been practicable to push uniformity with regard to the operating accounts much beyond the principal divisions of revenues and expenses. With regard to non-operating revenues, non-operating revenue deductions, income deductions and appropriations, substantial uniformity has been practicable and has been provided for in the accounting orders.

The smaller corporations are less highly organized than the larger corporations, and the minuteness of classification of labor which is practicable in the larger is impracticable in the smaller. Furthermore, the managers of the smaller corporations are in more immediate contact with the detailed affairs of the corporation, and for that reason do not need the minuteness of accounting that is imperative in the larger concerns. This condensation has seemed practicable only in the various income accounts. The capital accounts are accounts that continue during the life of the

corporation, and it is much more essential that the same scheme of accounts be continued throughout the corporation's entire history. The income accounts are closed annually, and a radical change in them produces little other inconvenience than to prevent comparisons with accounts of prior years. If the change is confined to a further subdivision of those of prior years, not even this inconvenience results. On the other hand, a change in capital accounts involves matters covering a very considerable period of time and the record of which is frequently too incomplete to permit re-classification. Growth is the normal course of affairs for a well-organized, well-managed public service corporation in a healthy and thriving community, and this fact, coupled with the well-founded conviction that there is necessarily a much more accurate accounting for capital than has prevailed in the past, has led to the provision of a single scheme of capital accounts for corporations of all grades in a particular class. The grading of corporations for purposes of accounting has been tentatively based on gross revenues from the several classes of operations: corporations whose gross annual revenues from any class of operations equal or exceed \$500,000 being placed in grade A; the next dividing line is placed at \$100,000, and the next at \$25,000. It is probable that it will be found necessary to establish a still lower grade.

The scheme of accounts and the scheme of reports are very closely connected, and the annual reports cannot be brought to show the situation fully and clearly until the scheme of accounts on which they depend has been brought into satisfactory form. Despite this fact, the commission was of the opinion that it was unnecessary to wait for the installation of the new schemes of accounts before materially extending the scope of the annual reports. An annual report of a corporation ought to furnish such information as should be filed regularly, not only for the information of the commission entrusted with the administration of such a law as the Public Service Commissions Law, but also for that of the investors furnishing the capital essential to the operations of the corporations, and for that of the much larger body of consumers for the satisfaction of whose needs the corporation exists and from whom are derived the revenues by which the corporation is supported. Much of this information is not given when the report is confined to a summary statement of receipts and expenditures. It is also necessary to know who are the individuals whose identity is frequently hidden behind the legal entity or fiction of the corporation; cases have occurred in times past where by hiding behind various corporate cloaks, individuals have been able to enrich themselves without rendering a fair return for the revenues collected from the public. The construction company and the supply company are familiar instances of such devices. For this reason it has been thought advisable, in the annual reports required of corporations, to go somewhat fully into the matter of intercorporate relationships, and to ascertain what corporations are related through being controlled one by the other or both by a third.

Another thing that has not needed to wait for a more complete establishment of a uniform system of accounts is the matter of new capital installed in service and old capital withdrawn from service. A much more complete return in this regard has been called for in the reports required of carriers for the period subsequent to June 30, 1907, than theretofore. It is hoped to develop this matter until there shall be on file with this commission a fairly complete exhibit of the changes occurring from time to time in the actual capital employed by public service corporations in rendering services to the public, to receive which the public has endowed them with corporate existence and privileges.

While these extensions of the scope of the annual reports necessarily make their preparation somewhat more expensive, the commission is of the opinion that the greater economy and efficiency of administration which it expects to result from them will more than compensate for the additional expense.

#### PREVENTION OF ACCIDENTS ON RAILROADS

This section relates chiefly to steam railroads, but the following reference is made to electric railways:

The inspector of electric railroads has been unable to cover all of the roads within the district during the year. The accidents to passengers upon electric railroads have been more numerous than to passengers upon steam railroads. Nearly 300 accidents have been investigated during the year by the inspectors employed by the commission. The causes of these accidents it is impracticable to reduce to mathematical percentages. The conclusions of the inspectors are very definite, however, upon certain points. The inspector of electric railroads says: "At least 90 per cent of the serious accidents on electric railroads in this district are the result of lack of proper equipment, failure of equipment, defective rules and methods of operation, or violations of rules. Not more than 10 per cent of the accidents are caused by defects in track or roadbed."

Among the recommendations made by the commission is one that the number of inspectors upon electric roads be increased.

#### WORK OF DIVISION OF STATISTICS AND ACCOUNTS

The commission says that many errors were found in the reports of corporations for the year ended June 30, 1907, and that nearly, if not quite every, corporation had to be written to once, and some of them several times, in order to secure the correction of errors. In most cases these letters brought replies indicating that greater effort would be made by the reporting corporations to make their subsequent reports more accurate. Examination of the reports received thus far for the year ended June 30, 1908, indicates, "on the part of most reporting corporations a conscientious effort to render accurate reports."

#### STREET RAILROAD INSPECTION

The report states that it was deemed advisable, when the inspection of electric railroads was commenced after the organization of the commission in July, 1907, to inspect first "those railroads on which the conditions and character of travel were such as to comparatively increase the dangers of operation. This class of railroads includes nearly all of the suburban and some of the smaller city railroads. During the six months ended Dec. 31, 1907, 36 such railroads were inspected, and the conditions on a number of them were found to be such that subsequent inspections were necessary, and some of these railroads have been inspected a number of times during the present year."

The report adds that "accident investigations upon electric railroads seem to be more imperatively needed than upon steam railroads, which is another reason for strengthening the accident investigation force relating to this class of railroads."

#### IMPROVEMENTS MADE

A list of some of the improvements made in consequence of recommendations and suggestions from the commission, affecting 27 roads, is given. The inspector reports that there has been a general improvement in track maintenance, methods of inspection, repair, cleaning and heating of cars, on nearly all the electric railroads subject to the supervision of the commission. In some cases improvements recommended have not been completed, and while companies affected have expressed a willingness to comply, financial conditions have prevented.

The Ohio Electric Railway, of Cincinnati, Ohio, has equipped for its Columbus & Dayton division a number of flat cars with removable sides, on which it is transporting large loads of hay and grain. To prevent fire accidents to the cargo, an asbestos fiber shield, 4 in. x 10 in., is placed under the trolley pole connection to catch any falling sparks.

### COMBINATION CLOSED AND OPEN CAR OF PAY-AS-YOU-ENTER TYPE FOR THE THIRD AVENUE RAILROAD COMPANY, NEW YORK

The Third Avenue Railroad Company, of New York, through its receiver, Frederick W. Whitridge, has just placed an order with The J. G. Brill Company for 200 pay-as-you-enter cars, which are to be the first of this type designed for use as open prepayment cars, with center aisles and cross seats. This object will be attained by employing removable sash and supporting panels, which will permit the sides of the cars to be open to the floor level. To insure safety to passengers and prevent boarding on the side when the car is in summer service, a metal screen will be attached to the posts. Storm curtains also will be installed between the window posts, as in other open cars. In most other respects, however, the new cars will not differ materially from the original design, which was described in the *ELECTRIC RAILWAY JOURNAL* of Nov. 21, 1908.

#### PAY-AS-YOU-ENTER DOOR AND PLATFORM ARRANGEMENTS

The same arrangement of body and end doors designed for the original double-end pay-as-you-enter cars will be used for the new rolling stock both winter and summer. As this feature was described in detail in the article of Nov. 21, 1908, its main points may be summarized in the following paragraphs:

At the conductor's end the doors on the entering side of the vestibule are folded in a front corner with a raised platform bench, and the opposite side is closed with a sliding door; at the motorman's end the folding doors are closed and give backing to passengers seated on the bench, while the sliding door opposite is opened for exit only. Similarly, the body end doors will consist of a sliding double-entrance door with 24-in. opening and a swinging exit door (at conductor's end), also 24 in. wide. The platform, railings and cash boxes will be as before. When the car is in summer service a folding gate 5 ft. high will be installed on the controller side of the platform. A wedge will be put on the inside of the gate, so that when the step-operating bar is down it will jam the gate and hold it rigidly in position.

Only the sliding doors will be used for exit at the front end, the swinging door then being blocked by the bench previously noted. In the original cars the seating is longitudinal, with removable seats next to the doors in use; in the new cars, which will have cross seats, free end movement will be secured by short longitudinal seats with folding outer ends. The width of the aisle will be 26 in. and of the cross seats 36 in.

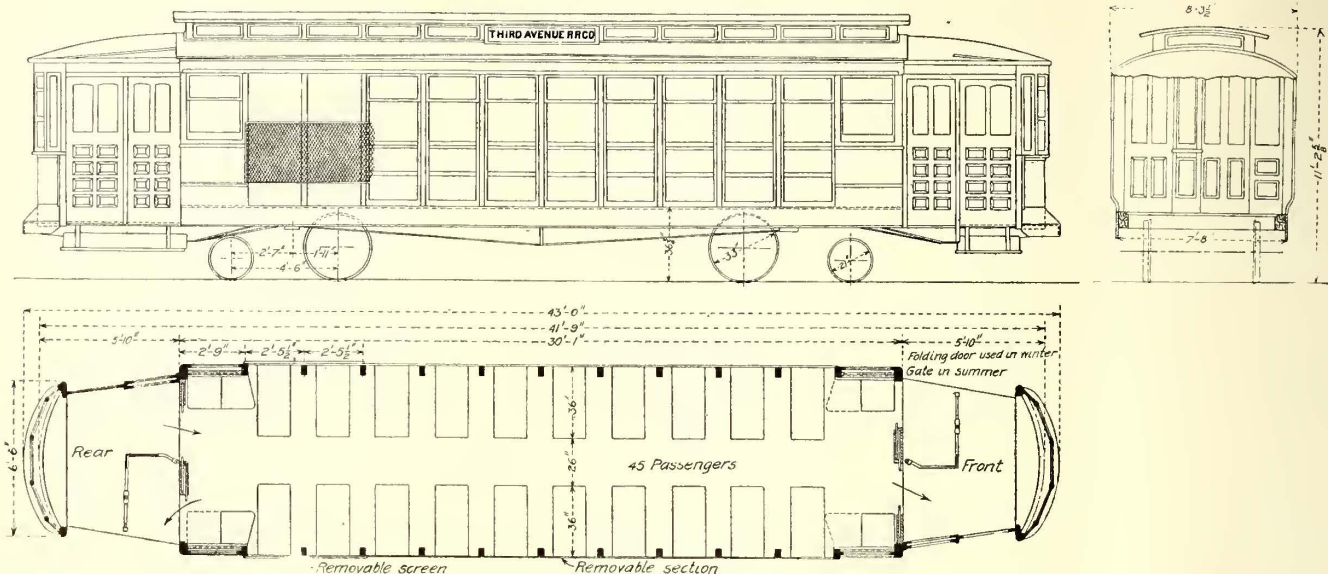
#### DIMENSIONS, TRUCKS AND OPERATING EQUIPMENT

In general dimensions the new car body will be 30 ft. 1 in. long over the corner posts, or 2 ft. 1 in. more than the first cars, and the length over the bumpers is 43 ft. instead of 41 ft. 1 in. Consequently no important change has been made in the platforms, which will be about 6 ft. long. The width of the car outside the sills will be 7 ft. 8 in., and there will be no material difference in the upper transverse dimensions. The maximum width over all is 8 ft. 3½ in., and over the window posts 8 ft. 2 in. The height from the rail to the top of the roof is not to exceed 11 ft. 2½ in.

The bodies will be mounted on two Brill No. 39-E center-bearing maximum traction trucks of 4 ft. 6 in. wheel base, with the pony wheels placed forward to reduce the platform overhang. The truck side frame is to consist

of solid forged side bars of a tensile strength of 55,000 lb. to 60,000 lb. per square inch. The Schoen rolled-steel driving wheels are 33 in. in diameter, and the chilled iron pony wheels 21 in. or 22 in., with 3¾-in. and 3-in. journals respectively. Symington gray iron journal boxes will be used. The driving axles are 4½-in. diameter steel, and

pine plated with 14-in. x 9/16-in. steel plate; oak crown pieces 2¼ in. x 14½ in.; oak crossings 3½ in. x 5⅞ in. The four center crossings will be located 4 in. from the bottom of the floor to the top of the crossing and 1¾-in. x 4-in. bridging will be used to fill the space between. The object in depressing these center crossings is to allow the



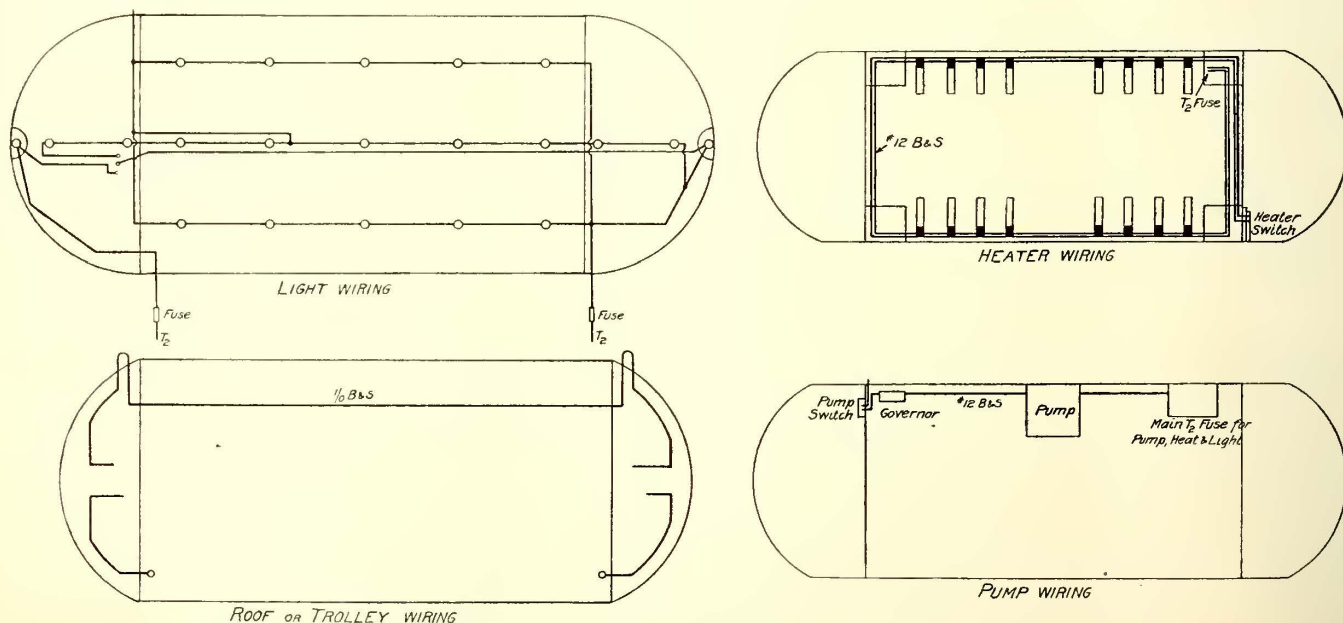
Third Avenue Combination Cars—Floor Plan and Elevations

are specified to have an ultimate strength of 50,000 lb. to 60,000 lb. per square inch, with an elongation of 20 per cent in 8 in. The trail axles are 3⅞ in. in diameter.

The shortest radius curve over which these cars will operate is 35 ft. The two interpole motors are of Westinghouse 310 type, rated at 60 hp at 500 volts and 75 hp at 600 volts. In addition to Allis-Chalmers air brakes, each car will be equipped with Peacock hand brakes. The brake rigging will be inside hung, but it has not yet been

various conduits, brake rigging and piping to be carried through the car without cutting the framing.

The two 5/8-in. diameter frame rods supplied at each of the four center crossings will be located as follows: The upper rod will be ½ in. from the bottom of the floor to the center of the rod, and the lower rod will be 5½ in. from the lower edge of the sill plate to the center of the rod. A 3/8-in. drop-forged steel plate extending 12 in. above the sill is to be used at the bottom of the post



Third Avenue Combination Cars—Wiring Diagrams of Principal Auxiliary Circuits

decided whether separate rigging should be installed for air or hand operation. The brake shoes will be of the American Brake Shoe & Foundry Company's Lappin design for 2-in. tread.

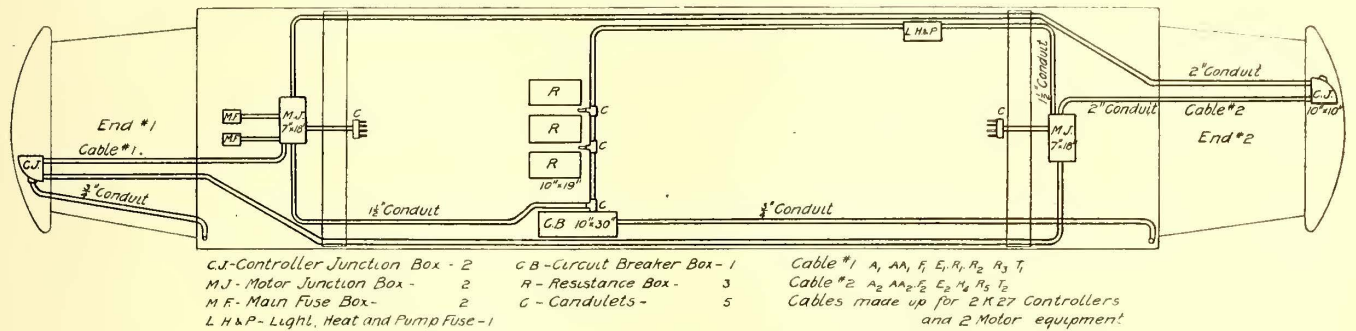
UNDERFRAMING AND BOLSTERS

The side sills are to be 4½-in. x 7-in. long-leaf yellow

where it joins the sill. This plate is to be forged to fit the post closely and envelop the side post up to the curtain groove as well as the face of the post. This plate is to extend to the bottom of the steel sill plate and be securely fastened thereto. The end panels of the car are to be strengthened by cross braces.

A 1½-in. truss rod will be placed under each side sill. It will be securely anchored by forged ends to the sill near the bolsters at each end of the car and be connected by turnbuckles near a suitable strain post located at the center. Each bolster will be made up of a 9-in. x ¾-in. wrought-iron top plate and a 9-in. x 7/8-in. steel bottom

vertible and interchangeable sash. The 1½-in. mesh screens used in the summer will be 30 in. high, and will be made in two non-rattling sections for each side. The vestibule sash will have five windows instead of three, to allow more room for controller and brake handle movement.



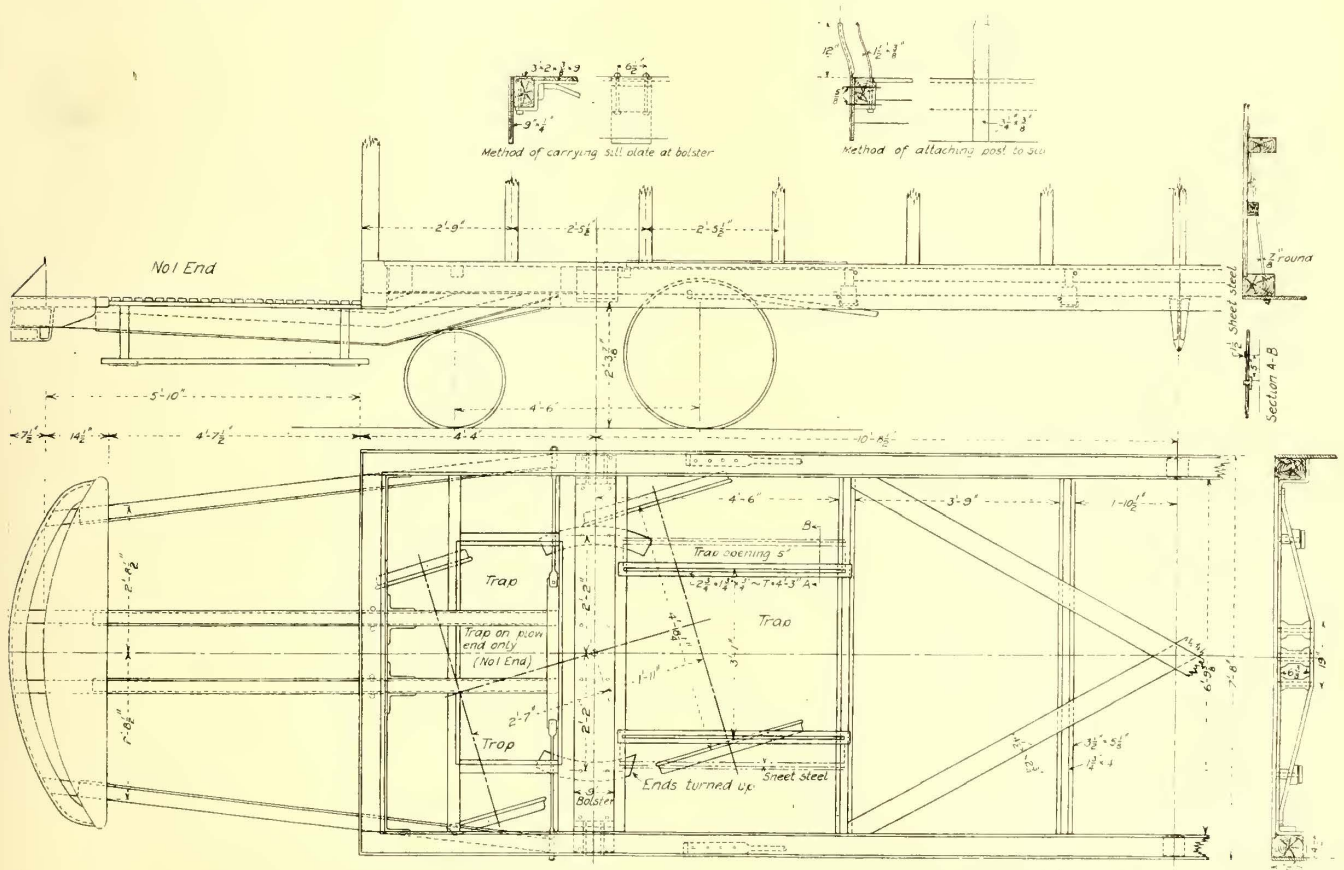
Third Avenue Combination Cars—Plan of Conduit for Main Motor Cables

plate with a wood filler. There will be four platform knees per car, the outside knees being 7-in. x 2½-in. angles and the inside knees 4-in. x 3-in. angles. These platform knees will be attached to a 3½-in. x 5½-in. cross sill extending the full width of the car alongside the bolster.

The car floor is to be of 13/16-in. Georgia pine screwed to the underframe. Between the seats the floor will be covered with maple strips. Motor and plow trap-doors are to be framed of ash and covered with galvanized iron on the under side. The platform flooring will be of 7/8-in. x 3-in. yellow pine on which maple strips will be screwed the entire length of the platform. The floor boards are to be screwed to wood fillers bolted to the knees. The platforms have folding steps.

BODY FRAMING, FLOORS AND ROOF

The car body will be arranged with 12 windows on each side, instead of the 10 customary for cars with longitudinal seats. Both the corner and side posts are to be of



Third Avenue Combination Cars—Details of Body and Platform Underframing

white ash, respectively 3/8 in. and 2¾ in. thick, located as shown in the accompanying plan. The vestibule posts will be reinforced with sheet steel corner irons at the joints.

The roof is of monitor deck type, with 12 openings on each side with wired ventilator glass. The deck posts and wooden carlins are of white ash. The steel carlins are to be forged in one piece to the top of the roof and securely bolted to the side plates and wooden carlins. The upper and lower deck are of poplar boards treated with

Each of the two end windows will be arranged with a pocket for dropping the upper half. The openings of the 10 windows opposite the cross seats will have fully con-

two coats of white lead and boiled linseed oil and covered with No. 6 cotton duck. The detachable hoods will be made of the same material as the roof, and will be provided with a watershed and  $\frac{3}{4}$ -in. run-off pipe. Four Hunter destination signs will be installed in the ventilator roof of every car.

The inside finish will be of silvered white ash with as little dirt-collecting moldings as possible. The ceilings will be of "Agasote," and advertising moldings will be provided for 11-in. cards. All inside metal trimmings are to be plain bronze.

The interior seating consists of 10 Brill 34-in. width reversible cross seats on each side of the car, with longitudinal seats in the corners. One-half of each corner seat can be folded up to allow freer passenger movement. Straps are provided at the ends only as the seats are provided with grab handles. The curtains are of Pantasote with protected groove fixtures.

#### PAINTING

The cars are to be surfaced and varnished under the following painting schedule:

- 1st day—Prime woodwork with pure white lead in oil and all ironwork with primer (iron primer).
- 2d day—Putty.
- 3d day—One coat flat lead.
- 4th day—First coat rough stuff.
- 5th day—Second coat rough stuff.
- 6th day—Third coat rough stuff.
- 7th day—Rubbed with pumice-stone and water.
- 8th day—First coat body color.
- 9th day—Second coat body color.
- 10th day—Third coat body color.
- 11th day—Color and varnish.
- 12th day—Stripe and letter.
- 13th day—First coat finishing varnish.
- 14th day—Second coat finishing varnish.
- 15th day—Stand.
- 16th day—Third coat finishing varnish.
- 17th day—Stand.

#### INSIDE PAINTING

- 1st day—Filled, Moser's filler.
- 2d day—Shellac (grain alcohol shellac).
- 3d day—First coat rubbing varnish.
- 4th day—Second coat rubbing varnish.
- 5th day—One coat finishing varnish.

#### ROOF PAINTING

- 1st day—Prime, pure white lead and oil.
- 2d day—Stand.
- 3d day—Stand.
- 4th day—First coat standard roof color.
- 5th day—Stand.
- 6th day—Stand.
- 7th day—Stand.
- 8th day—Stand.
- 9th day—Second coat standard roof color.

#### FLOOR PAINTING

One coat of metallic brown and one coat of standard floor color and varnish. Bottom of floor painted with metallic brown. Murphy's best outside rubbing varnish for inside work and best wearing body for outside work. The colors for body, trimmings, lettering, roof and floor to be the standard of the Third Avenue Railroad Company.

#### THE CAR WIRING

The J. G. Brill Company will install all the wiring except that for power, heating and the air brakes, which will be done by the Third Avenue Railroad Company. The car-builder, however, will also install certain portions of the heater and pump wiring. All wiring and various material will be tested at 2000 volts, subject to the approval of the New York Fire Insurance Exchange, and will be carried

out according to the following specifications and accompanying drawings:

#### ROOF OF TROLLEY WIRING SPECIFICATIONS

The conductor shall be designed for 600 volts No. 0 B. & S. stranded wire, insulated with a compound containing 30 per cent Para rubber of not less than  $\frac{5}{64}$  in. in thickness at any point. The rubber insulation will be protected by a substantial braid or tape covering with an additional flame-proof braid at least  $\frac{1}{32}$  in. thick and saturated with a preservative flame-proof compound. The finished covering will withstand any abrasion that may arise during the installation of the wire on the cars and will be satisfactorily elastic to permit being bent to a radius twice that of the wire without injury.

Flat wooden molding will be fastened to the side roof of the car and grooved on the bottom side to allow water to pass under the same. This is to run 6 in. beyond the last carlin on each end of the car. The roof or trolley wire is to be fastened to this molding with brass cleats and screws. Cleats are not to be over 8 in. apart. This wire will continue on the side roof to a point on the side of the vestibule roof. The wire then will enter the vestibule in an upward direction to avoid water following it and then around the top rail of the vestibule in the molding to the hood rafter and along the hood rafter to the main motor switchboard located on hood within easy reach of the motorman. The wire then should continue on the hood rafter around the vestibule top rail to the corner post, down the corner post in conduit and through floor. The conduit shall be suitably threaded for extension, leaving sufficient wire to reach the circuit-breaker box under the floor of the car at one end and sufficient wire to reach the controller junction box at the other end. The wire at the main motor switchboard is to have ends at least 18 in. long.

#### LIGHT WIRING SPECIFICATIONS

Each car will be wired for 16-cp lamps. The outlets are to be for single Keeler sockets distributed as follows: Five lamps on the longitudinal center line of the monitor ceiling, five lamps on the lower deck of each side of car, one lamp under each canopy hood to light the platform, one lamp for the electric headlight at each end of the car, to be operated by one two-way and one three-way switch; also one light back of each Hunter vestibule sign.

The wires on the ceiling of the monitor lower deck and under the canopy hoods are to be run in molding. This molding is not to be less than  $\frac{3}{8}$  in. in thickness at the back of the covers and the capping is to be not less than  $\frac{3}{16}$  in. The groove for the wires will have such a width that the wires will have to be pressed into them, but not tight enough to require pounding. The backing and capping will be secured in place by screws, no tacks or nails being used in the molding. Moldings will have both inside and outside two coats of waterproof paint. The joints of the moldings will be mitered to fit close, there will be no splinters or sharp corners in the moldings or base, all sharp edges being smoothed and all corners slightly rounded. Base blocks of same material as the interior finish of the car are to be provided at the outlets for lamp sockets and be not less than  $\frac{3}{8}$  in. thick where wires pass through and of a diameter not less than 2 in. larger than the socket. These blocks are to be securely fastened by overhead screws of the same material as the metal trimmings. The conductor is to be designed for 600 volts No. 14 B & S stranded wire insulated with a compound containing 30 per cent Para rubber of not less than  $\frac{3}{64}$  in. in thickness at any point and protected like the trolley wire.

#### PART AIR PUMP AND HEATER WIRING

The car-builder will furnish and install that part of the air-pump wiring from the switch located on the bulkhead down the corner post to the floor of the car, leaving 4 ft. of loose ends of wire. The conductor is to be designed for 600 volts No. 12 B & S stranded insulated with a compound containing 30 per cent Para rubber of not less than  $\frac{3}{64}$  in. thick at any point and protected like the trolley wire.

The car-builder also will furnish and install that part of the heater wiring from the heater switch located on the bulkhead down the corner post on the opposite side of car, leaving 4 ft. of loose ends of wire. Also the car-builder is



to install and the railroad company to furnish the heater switch and heaters. The word "install" in this instance is understood to mean that the car-builder will furnish the heater brackets and bolts to secure the heaters to the seats, the heater switch mounted on the switchboard and screwed to the backboard. Conductor to be No. 12 B & S stranded and of the same wire specifications as called for under lighting and pump wiring.

#### GALVANIZED IRON UNDER FLOOR OVER RESISTANCES AND MOTORS

The car-builder will furnish and install under the floor of car directly over the resistance boxes, galvanized No. 22 sheet iron. This sheet iron is to extend at least 12 in. beyond all sides of the boxes. An air space of 2 in. will be provided between the sheet iron and floor. Sheet iron shall cover that part of the car floor directly over the motors.

#### PUSH BUTTONS

The push-button circuit will be operated on 600-volt current through resistances instead of a storage battery, according to the method of the Consolidated Car Heating Company. The push buttons will be placed higher than usual to avoid their operation by children.

The conductor for this wiring is to be No. 14 B & S stranded and of the same wire specifications as called for under lighting and pump wiring. All splices or joints will be both mechanically and electrically secured without solder. The ends of the wires will be filled and turned in so that there will be no short projections to cut through the insulation. No acid will be used to clean wire and no acid flux shall be used in soldering. All joints are to be poured with hot solder and the material to be used is Allen's soldering paste. All wires are to be readily accessible, especially where taps are made and where wires are run to switches. The ends of the wire will be at least 6 in. long for convenient connection to switches. The wires running down the corner posts will be run under the end of each seat. All wires will be protected where they enter car or vestibule to prevent ingress of moisture.

#### WIRING DONE BY THE RAILWAY COMPANY

The railway company will do the installing of the power equipment, including metal junction boxes, metal conduit to carry the cables and other wires under the car floor; the transite for the resistance boxes, motor junction boxes, resistance junction boxes and controller junction boxes; bell mouths and rubber gaskets; metal junction boxes under controllers for protecting cables entering the controller; splash pans under the circuit-breaker box and resistance; pipe hangers, resistance sticks and hangers, circuit-breaker boxes and metal conduit brass sleeves are to be soldered on resistance lead so that they enter the lug on resistance boxes a neat fit. The railway will also attach the motor and resistance lead to cable. All trolley resistance leads and motor leads coming out of junction boxes or conduit are to be protected separately by rubber or porcelain bushings.

#### ENGINEERING

The specifications for these cars were prepared by T. F. Mullaney, chief engineer, under the direction of F. W. Whitridge, receiver, and E. A. Maher, general manager, Third Avenue Railroad Company.

Because the American-Canadian Company, of Rio de Janeiro, operating the city railway system, changed its fares and routes, a mob burned 12 of its cars on Jan. 11. The police were helpless. The company left the adjustment of affairs in the hands of the Mayor and quiet was restored.

In the British House of Commons a member has asked the consideration of a regulation compelling electric cars, among other vehicles, to carry speedometers, that the public be safeguarded against reckless speeding and the motormen protected against the charge of exceeding the speed limit.

## THE PROBLEM OF REDUCING ACCIDENT DAMAGES—III.

BY FREDERICK W. JOHNSON, ASSISTANT GENERAL CLAIM AGENT,  
PHILADELPHIA RAPID TRANSIT COMPANY

The question has sometimes been asked in the past: "What is the character of the instruction given in the classes; how is it prepared, and under what conditions is it imparted to the men on the cars?"

There must be, of course, a wide difference of opinion on the points involved in a question of this character. What appeals to one man, may meet with the emphatic disapproval of another; likewise, what would prove applicable to one situation, may be entirely inappropriate in another. These problems can be solved easily, however, if the fact will be borne in mind that conditions in different localities necessarily require varying methods of procedure. Claim men have been inclined too often in the past to reject ideas or suggestions at their face value for conditions entirely different from those under which the ideas had been worked out.

We have often failed to go sufficiently deep into an idea as to enable us to get the real underlying principle. There has been a tendency to reject or to adopt measures on snap judgment. We have often neglected to consider just how an idea which has been giving results in one section, might be so revamped or revised as to meet difficulties in our own community which were practically the same, but which possibly might have to be approached from a little different angle.

This attitude has been fostered, perhaps unconsciously, by the belief of the average claim man that his own particular company is confronted by what is probably the hardest proposition in the entire country, and that methods used in other localities would prove of little value for him. If there is any one section where conditions are not trying, and becoming more and more so each year, we have yet to hear of it. In view of this fact, it is urged that greater consideration be given to suggestions of a remedial character than has been the case in the past.

Coming back, therefore, to the original question, we can offer, merely as suggestions, the methods pursued under the conditions which confronted us on the lines of the Connecticut Railway & Lighting Company. Whether the methods followed would have been feasible in other localities never received consideration for the reason that the company was interested in no situation outside of its own.

The material used in the earlier classes was founded on certain portions of the company's rule book which referred particularly to the work of handling accidents. These topics were taken up individually and enlarged upon and illustrations furnished; ample opportunity was given the men to ask questions. In some respects this idea proved successful, and in others it fell short of the object desired.

In the first place, the average company rule book is dry in its treatment of subjects, formal in tone, stilted in manner and more or less of an enigma to conductors and motormen. A good deal of it becomes obsolete and out of date eventually. Few trainmen ever get beyond the eighth or ninth page in reading it; taken even in its best light, the average book has serious limitations in its adaptability to accident work. It will immediately be argued that if the men are not familiar with its contents, so much the greater reason exists why they should become acquainted with it. That is very true, insofar as it relates to operating questions. But, with respect to accident work, why not place

instructions before the men in the most advantageous manner possible? If material can be imparted to them so as to make it interesting, and at the same time instructive, with the added probability that more satisfactory results will be secured thereby, why should one stick to the dry, stereotyped company rule book, which from time immemorial has proved a failure in this particular respect?

The rule book idea eventually gave way to the practice of speaking extemporaneously, with the aid of notes. This proved to be a step in the right direction, but still was not wholly satisfactory. The field was so extensive, and the desire to cover as much ground as possible so strong, that difficulties arose in regulating the length of time devoted to each class. One subject led to another and that to still another, until it was found that the allotted time had expired, with many points left still uncovered. Again, the instruction given in different localities was bound to vary under this method, and thus to detract from the uniformity of the work.

The advisability of allowing the men to ask questions at these meetings came up for consideration about this time. The practice up to that time had been to encourage the men to ask questions. It was eventually found, however, that this custom was not desirable inasmuch as the questions asked were usually of little value. The time allowed for classes was interfered with seriously if many questions were asked and the men took advantage of the opportunity to get in digs of various kinds at the expense of the local superintendent. The privilege was, therefore, withdrawn, and an announcement substituted that questions should be reserved until the dismissal of the class, when the instructor would be pleased to discuss the problems personally with those who desired still further information. This method has given satisfaction since and the change has proved beneficial in every way.

#### LENGTH OF TIME OF CLASSES

The length of time to be devoted to classes also received considerable thought. For the first year and a half, when the company was depending solely on oral instruction, the classes averaged from one hour and a quarter to one hour and a half in length. This was, without question, a little too long, especially for evening meetings, and the conclusion was reached that it would be better to cover less ground in the classes, and to make more forcible whatever points were taken up. The length of meetings was, therefore, reduced to one hour or a trifle less. This practice has since been adhered to.

The frequency with which classes could be held to the best advantage was another mooted question. This point has been touched upon already. The suggestion is advanced again that in this respect, as in all others, the method to be followed must be governed largely by the conditions existing in each individual community. With the men of some companies, classes can be held advantageously with greater frequency than with others. Dr. Ryan, of Syracuse, N. Y., in his very excellent paper before the Atlantic City convention in October last, stated that he had secured excellent results by holding classes monthly.

In the main, however, to such as have not heretofore taken up this work, the suggestion is advanced that there is some danger of dampening the interest of the men in the work by holding classes too frequently, and by thus covering much of the same ground at short intervals. Dr. Ryan, we believe, follows the custom of introducing an occasional smoker or similar form of entertainment in connection with his classes, which, of course, serves to quicken the interest

of the men and to operate against the possibility of the danger mentioned.

Provided that some means is devised for keeping in touch with the men in the period intervening between the meetings, the writer personally favors but two classes a year, as stated. A distinction must be made, however, between large systems and small, and between urban and interurban properties. On systems of moderate size or on outlying roads it is possible to proceed on different lines than would be possible with systems of greater magnitude. The caliber of the men employed on the cars is decidedly different; in fact, all of the natural advantages in the work lie with the former as against the latter class of roads.

The size of classes is another point to which attention should be given. At first it would appear as though the best results could be obtained by keeping the size of classes somewhat restricted. Experience has demonstrated, however, that there is really little, if any, reason why classes should be restricted in size unless it is expressly desired. With the assurance of proper discipline, without which little progress can be made under any circumstances, the instructor will invariably find greater inspiration in addressing large classes than small classes. With the elimination of the question feature, large classes may be handled as rapidly as small classes, with the added advantage of covering the system with greater celerity. Work of this character consumes more or less of the nervous energy of the instructor; the greater the number of classes, therefore, the greater the strain on the instructor, who, we apprehend, will be obliged meanwhile to keep up his customary duties.

#### SCHEDULE OF CLASSES

Having prepared the material to be imparted to the men, in the form of a paper, a conference should be had with the officials of the operating department for the purpose of having a schedule of classes prepared covering the entire system. As far as possible avoid listing classes for extremely early or late hours. The reasons are obvious. The opening class at a carhouse should be scheduled as an evening class, for the reason that evening classes are more successful than others and are usually the heaviest in point of attendance. Notices that classes are to be held should be posted in the various car houses several days in advance of the first meeting in order that the attention of the men may be secured.

On the Connecticut system, with the final arrangement of but two classes a year, it was found necessary to establish monthly classes for the instruction of new employees. This has been enlarged on still further, as will be explained in a later issue. To these monthly classes older employees who had demonstrated their need of additional instruction were sent. This arrangement enabled the company to progress in the character of instruction given each year without repeating the work done for the benefit of new employees.

At first the company did not reimburse the men for the time consumed in attending classes. This plan was changed subsequently, and thereafter each man was allowed his regular rate of wage for time so spent; this practice unquestionably is fair to the men, and is, in the long run, advisable in every way.

The language to be followed in placing instruction of this character before the men should receive careful consideration. It should be remembered that the average company rule or regulation is written invariably in formal language. For this reason, many of the rules do not have the attention of the men as they should. Conductors and motormen

are often deficient in education, and consequently do not grasp the point of a ruling as quickly or as satisfactorily as might be desired. The well-known dry, stilted language employed, so often, adds to their difficulties, and likewise to those of the company.

The writer has always favored the adoption of a more or less free and easy style in directing work of this character. Every effort is made to make the material interesting to the men, by employing to a reasonable degree the language of the men themselves, avoiding, of course, anything which might detract from the dignity of the work, or which might suggest a way for ridicule or criticism. In seeking to secure the good-will and the hearty co-operation of the men on the cars in accident work, no real harm can come as the result of an effort to inject "red blood" into the work.

In addressing classes of conductors and motormen on the subject of accident work, or in preparing printed material for their instruction, so express yourself as to bring your thoughts within the scope of their understanding. Leave out unnecessary red-tape and superfluous preliminaries. Get right down to the point of the situation. Drive one point home solidly, rather than attempt to make a number weakly. Forget the question of accident damages; your men are not lying awake at night worrying over the cost of litigation to their employers. Confine your efforts rather toward improving the work of the men in handling accidents, and in preventing accidents. The financial end of the problem will take care of itself to your entire satisfaction if you will attend to the instruction of the men.

In the light of past experience, we cannot urge too strongly the importance of mapping the work out in advance on a systematic, business-like basis. In this way only can the work be so regulated as to produce results of a satisfactory nature within a reasonable period of time. A haphazard, uncertain, hit-or-miss plan of campaign can result only in confusing the minds of the men on the cars and will surely delay improvement in their accident work.

The field is so broad, and there are so many subjects that can be taken up with advantage, that the temptation is strong to pass rapidly from one to another, with the resultant danger of skimming along the surface without penetrating sufficiently deep to effect any permanent improvement. The question will be asked many times: "Why don't you take up this subject, or that, or some other?" Attention will then be directed to the fact that accidents of a certain type are occurring frequently in some particular locality, while still another type is giving trouble at the same time in a different direction. To give heed to all of these suggestions is to court demoralization for the work. Many minor difficulties will correct themselves as a direct result of the crusade against other and more important defects. The suggestion is, therefore, advanced that a plan of campaign be agreed upon first of all, and secondly, that having once decided upon a certain definite course of action that it be adhered to rigidly.

The question may be asked: "Just what is meant by a plan of campaign?" The answer is simply this: The mapping out of a definite plan, based on a course of instruction to last one, two or three years, depending on the size of the system and the seriousness of the undertaking; the determination of just what subjects are to be discussed with the men, and then a decision as to the order in which they will be taken up. Next, a distinction should be made between instructions which are designed to improve on the handling of accidents and those which are intended to operate to prevent accidents.

#### TWO YEARS FOR PRELIMINARY INSTRUCTION

Taking up these points in the order given, the writer favors a period of two years as a foundation for the period of preliminary instruction. Sufficient progress should have been made after that time had elapsed to enable those in charge of the work to broaden the scope of action considerably. With respect to the matter of subjects, it really simmers down to the question: "What are the points of greatest weakness in the system?" The following suggestions for subjects may be made: The importance of reporting promptly all accidents; instruction as to the correct method of making out accident reports, so as to bring out all of the essential facts; the vital necessity of obtaining witnesses; suggestions regarding the proper methods to be pursued in the work of securing witnesses; the value of reticence in connection with the subject of company accidents; the joint handling of accidents by conductors and motormen; the treacherous "unreported accident" problem. Then come such topics as head-on, rear-end or right-angle collisions of cars; collisions with teams; premature starts of cars while passengers are boarding or alighting; the absolute necessity for careful operation of cars when passing obstructions close to the track; accidents to pedestrians; passengers injured while attempting to board or to alight from moving cars; ejections; derailments; dangers at grade railroad crossings; and so on without end.

The writer advocates strongly the practice of teaching the men first how to handle accidents satisfactorily, and of then taking up the subject of the prevention of accidents. To reverse this order or to attempt to take up the two subjects at once is to encourage an increase in the "unreported accident" record of the company. When a company begins to urge its men to avoid accidents, or to prevent accidents, it immediately opens wide the door to the "unreported accident" column, unless it first has inculcated in the minds of the men the conviction that when an accident actually happens, a prompt report must be submitted immediately to the proper department. The temptation is, of course, for a company to take up immediately the work of preventing accidents. In the end, it will be found, however, that the work of teaching men how to handle accidents properly will yield just as large returns on the investment as instruction concerning the prevention of accidents. This fact is overlooked frequently. Hence the advice is: First teach the men how to handle accidents, and then take up the work of preventing accidents.

Work of this character, when once started, should be followed up systematically. A regular course of instructions, delivered at certain stated intervals, and carried out on definite, intelligent, progressive lines will produce encouraging results of a permanent nature. On the other hand, occasional, spasmodic efforts, followed by long periods of inactivity, will produce disappointment. It is one thing to instruct a man, and to then let the subject drop; it is quite another thing, however, to instruct a man and then to follow him up for the purpose of seeing that he not only understands the orders, but also that he obeys them to the best of his ability.

The influence of the local superintendent is a powerful factor in gaining and holding an advantage. He is in daily contact with his men and, if so disposed, is in a position to help to hold their interest. The plan of having the superintendent examine personally the report and the crew in every case of accident has been of great assistance to the work in the past. He may do nothing more than compliment the men on the satisfactory manner in which they acquitted

themselves in handling an accident, or he may find it necessary to take them to task for some infraction of rules, or failure to do their best, or he may find it necessary to caution or instruct them regarding some particular feature of the work. In any event, the fact that it is understood by the men that they must appear in person before the superintendent in each case of mishap, has the effect of influencing them toward a strict observance of orders. Such a practice, however, may be carried too far through unreasonable severity on the part of the superintendent, or by obliging the men to lose valuable time in waiting indefinitely for an opportunity for an audience. Not only is such treatment unfair to the men, but it has the additional drawback that it lets conditions fall back into the old rut by again holding out the fatal temptation to the men to neglect to report their accidents; from that state of affairs the company has far more to lose than have the men.

#### DESIRABLE FOR THE CLAIM DEPARTMENT TO DO THE WORK

In treating this subject, the writer has proceeded on the assumption that work of the character outlined should be assigned to the claim department rather than to the operating department. The question as to which of the two departments should have supervision has been raised a number of times in the past, but in every case, so far as we have been able to learn, the work has been assigned to the claim department. It seems as though this is the proper course to pursue, inasmuch as the instruction involves necessarily a thorough knowledge of claim and of accident work. We have no doubt that the work could be carried on successfully by the operating department, provided sufficient time and study were to be given to the subject, but we question seriously whether as great a measure of success could be secured as would be probable if the claim department conducted the campaign. In any event, however, the closer the relationship between the two departments, the greater the probabilities of ultimate success.

What is probably the most important factor of all in connection with accident work is the spirit with which the work is received by the men on the cars. Whether it will prove successful, or will fail miserably, will depend directly upon the attitude of the men. If the work fails to appeal to them or to arouse sufficient interest to insure their hearty co-operation, the combination is wrong somewhere. The success of a company in work of this nature will depend primarily upon its ability to interest its men in the plan.

The adoption of a liberal, broad-gage policy toward the men is one of the first essentials to success. Every reasonable effort should be made to cultivate as friendly relations between the men and the company as possible. It is human nature to feel pleased at a word of commendation in appreciation of faithful work, and the man who actually has his heart in his labor is worth four of the type who are merely filling in time until pay-day.

The old "horse-car" idea of discharging employees right and left for minor infractions of rules, with a view to injecting carefulness into the men, is a distinct obstacle to the successful solution of the accident damage problem. Such a practice never served any good end, and never will.

We teach new men to operate our cars, and just when we have developed them as experienced conductors or motormen, we discharge them for petty reasons. Then, in the fullness of our wisdom, we employ other new men to replace the old, and proceed as before. Meanwhile, the company foots the bill. The object is, of course, to hold up the dismissed employees as "horrible examples" to the rest of the men. Here the scheme fails; the great majority of the

men do not learn the details, and with those who do, the effect is temporary. They will remember, however, that a man was discharged for striking a team long after they have forgotten the name of the man; and more than one will conclude that the man really made his mistake in saying anything at all to the company about the affair. From such an argument the unreported accident of the future arises.

Allowing, of course, for reasonable exceptions, where is the justice of instructing a man in one breath to report all of his accidents and of discharging him in the next because he obeys orders? The better grade of men are not looking for employment of that sort. The average company does not hold a hair-trigger over its superintendents every time that they make a mistake. Then, why should it do so with its conductors and motormen?

Any type of man can criticize the efforts of others, but it requires men of a higher order of intelligence to distinguish between the good and the bad intentions in a man's work and to offer encouragement at a time and under circumstances which results in bringing to the surface feelings of friendship and of good-will, instead of bitterness and hostility. We should never lose sight of the fact that our most powerful allies in the work of preventing accidents, and of handling accidents, are the well-meaning, hard-working men upon our cars.

*(To be continued.)*

#### CAR HOUSE FIRE PROTECTION

At a recent meeting of the car-house foremen of the Boston Elevated Railway Company the question of fire protection was thoroughly discussed from the practical standpoint, and through the courtesy of the company the following notes of the meeting are printed. F. F. Low, architect of the company, opened the discussion with a paper in which he emphasized the importance of keeping the car houses clean, so that the blame for a fire cannot be laid to this cause. It is an easy matter to leave a little oily waste about or a few shavings in a corner or a little paper in a locker ready to catch a spark and smolder and then spring into a blaze at a time when least expected. It is just as easy after the habit is acquired to keep everything picked up. There is a standing order about dust and rubbish under car houses, and the building should be inspected all over occasionally to avoid trouble from this source. Rubbish should be kept away from the outside of the building as well as from the inside. The company cannot clean up its neighbors' land or order it cleaned up, but the insurance companies are interested in both properties and will see that it is cleaned up if complaint is made.

Many fires occur on account of cars being left in improper condition for the night. To see that cars have been left in the right condition when first pulled in for the night is not all that is necessary. All openings to the building need to be properly guarded so that trespassers cannot gain entrance to a car for malicious purposes or to find a resting place for the night. Mr. Low felt that there was more to fear from malicious persons entering a car and turning on the heaters or motors than from any other cause. Several fires have been caused by boys. In one case they set the brakes and then turned on the controller. Up to within a few months ago it was comparatively easy to gain access to the car houses of the company at any time of night through small unguarded doors. These should either be closed at night or, if left open for ventilation, a slatted door should be used.

Eternal vigilance, men on the ground with good knowledge of the apparatus, and plenty of fire-fighting equipment are essentials for the prevention of fires. All three of these features the company is constantly striving to maintain. It has recently expended more than \$50,000 in sprinkler equipments besides several thousand dollars more in minor improvements. The company has lately introduced fire drills with water turned on at its car houses and the benefit is clear, although it is often difficult to secure permission from the municipalities to hold such drills, and in every case the cities have to be notified in advance. The object of the drill is lost if the men are informed beforehand that it is to take place. One of the most important matters to provide for is to have a responsible man in charge when the foreman of the house is away. The force needs to be drilled in charge of the sub-foreman as well as the foreman, and to have its duties clearly understood in case both of these men are away. Some of the drills can be held better with the foreman acting only as a spectator. It is of the utmost importance that the house shall not be left at any time, even for a short period, without some one in charge who knows what to do in case of fire. All men who are liable to be left in charge should be instructed that they are to be the brains of the establishment in case a fire breaks out, doing no work themselves other than to direct the rest and noting that every position is promptly filled. Such a man must be ready to jump in anywhere that he sees prompt and quick action is needed.

The best drills are made when the foreman has first called the men about him and given instructions in a clear and concise way and then sent them to their duties. At first a little time may be lost by this method, but it is more than made up because the men know perfectly what is required. Some of the poorest drills have been when the foreman has run out with the hose or has gone to turn on the water or do something else and left the men without instructions as to what they were to do. When the call for water is made a man should be at the standpipe valve. If a foreman directs instead of taking part in the work he will at once see that the position is properly filled or jump to the valve himself. Another point is to see that the starters take a more active part in the monthly drills. They are always on duty, used to giving directions, and as they are seldom shifted, make a strong addition to the fire-fighting force. The starter should have such knowledge of the equipment that if there is no one in the pit room to take charge the starter can do it. Finally, the report card is not intended as a matter of form, but as a reminder of the fact that the equipment needs constant care in order that it may be ready and efficient at all times. It will not answer the purpose to copy last month's record; to say a valve is open when it is closed, or to fail to report a bad hose or a leaky valve when discovered. It helps if the superintendent of a division takes a personal interest in this matter of fire prevention.

O. B. Johnson, of the Boston Board of Fire Underwriters, followed and spoke of the importance of fire protection and the special value of ability on the part of car-house pitmen to fight the fire, with their close personal familiarity with the local situation. The first gaining of headway is the vital point to prevent. Car houses are usually destroyed because the fire so often gets beyond control before the department can reach the spot.

Mr. Johnson then discussed a number of practical points which are of direct importance in fire prevention and ex-

tinguishing in electric railway car houses. While many of these appear self-evident, they are by no means imaginative from the point of view of the inspector who desires to improve conditions in properties insured by his company. Among these points were the following: Bells giving out in sounding the alarm; bells not provided with good pulls; bells not sounded loud enough nor long enough; poor adjustment of bells; extra hose not carried in the proper way, in some cases being tangled; twisting of hose in unrolling; occurrence of short bends of the hose at the valves and other points; failure of men to stay at the valves and insufficient knowledge of what is to be done to turn on the water; sticky gate valves at the foot of risers; ignorance as to which way to turn to open valves; turning on water before the hose line is completed and thus causing much delay; battered couplings and lack of proficiency in coupling; no definite and prompt action on fire doors; too many valves kept closed between the street supply and the hose during the cold season; failure to open valves wide; hose nozzle left to itself and lack of understanding as to which employees shall answer a fire call. The tendency to do something in great haste should be changed into an understanding of how to do a specified thing quickly and well. The process of getting water into a hose needs to be made as simple as possible. A man of inferior intelligence will be able to get simple apparatus into action, but will fail utterly with a little added complication. This fact has a direct bearing on the safety of railway property where only a few car washers are left on the premises at night. Perhaps \$15,000,000 worth of property is in charge of the men in the car houses on the Boston Elevated system, and the man in the car house is in the last analysis the reliance of the company in fire protection.

The history of car-house fires shows conclusively that there has never been much done in the way of getting cars out of houses. The advisability of abandoning everything and taking the cars out is questionable. There is a standing order that in case of fire, however slight, the city department is to be called first and then the force must do all it can to fight the fire. When this is done, if the fire is too large, it must be left to the city department. If cars are taken out the street is filled up, interfering with the department and car movements. If the crews are doing all they can with the hose the starter who is in command may, if there is any help around, save the rolling stock, but it is questionable practice.

Paul Winsor, chief engineer of motive power and rolling stock, concluded the meeting by emphasizing the futility of trying to move out cars in case of fire and pointed out that the fighting of the fire is the first thing to do in all cases. He stated that most of the obstacles to getting water on promptly are of the simplest nature and that practice in these operations is most desirable. It is an easy thing to teach men to unreel a hose properly, so that it will not kink, to attend to the valve equipment, acquire proficiency in coupling up and general handling of the apparatus. In the Boston drills one crew succeeded in getting on the water in 48 seconds after the alarm was sounded and the average for 22 houses was 1 minute 52 seconds.

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A recent heavy snowfall in Liverpool, England, and its vicinity delayed traffic on the electric railways for several days. About 104 miles of track were salted by 14 wagons, each manned by four men, who applied 300 tons of salt.

**NEW CARS FOR THE STERLING, DIXON & EASTERN**

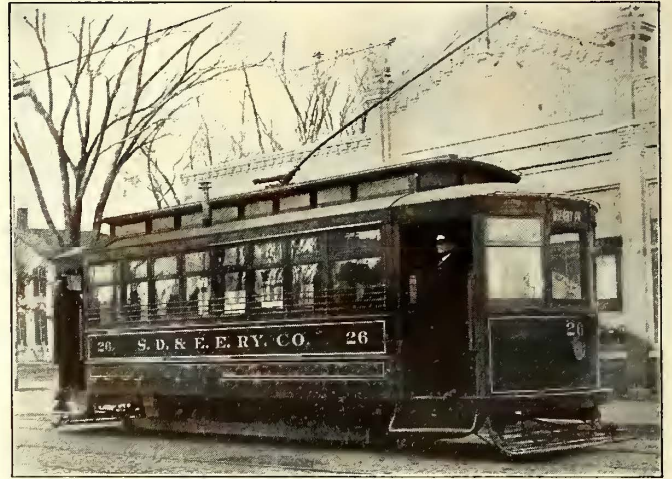
During the past year the Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., has shown a very substantial increase in earnings. This additional income has been brought about by careful work on the part of the management, not only in soliciting traffic, but also by improving the service. The company has recently purchased from the St. Louis Car Company four cars which are especially well designed for use in local city service. The interurban line of this company connects the cities of Sterling and Dixon, each with a population of about 10,000, and in each city the railway company operates a local schedule with two cars. In regular operation a car crew comprises but one man, and the Johnson fare box is used for collecting fares. The new cars, here described and illustrated, have been in service now for two months.

All four cars are alike in design and equipment. The bodies are framed for eight windows on each side and two windows and single sliding doors in each end, provision being made alongside of the end doors for mounting a Johnson fare box. The body and roof framing is substantial with steel reinforcement and the underframing of oak is reinforced with 5/8-in. steel plate along the side sills. The drop platforms are enclosed with round-end vestibules having three windows and double folding doors on each side. The vestibule is covered below the windows with No. 14 sheet steel placed both inside and outside of the framing.

The general dimensions of the car are as follows:

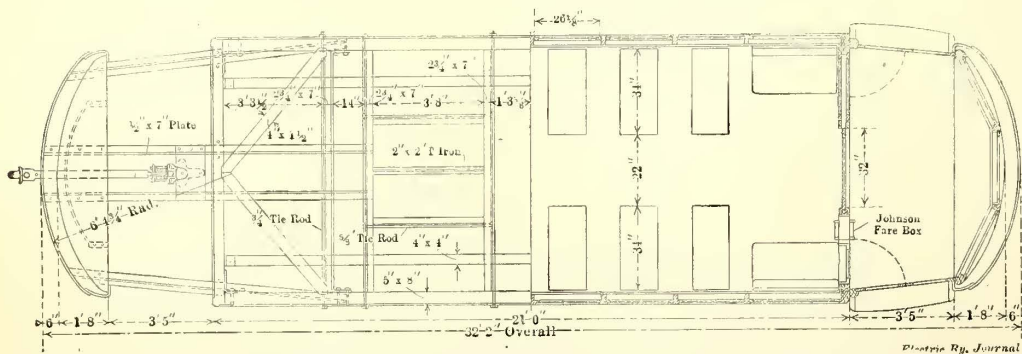
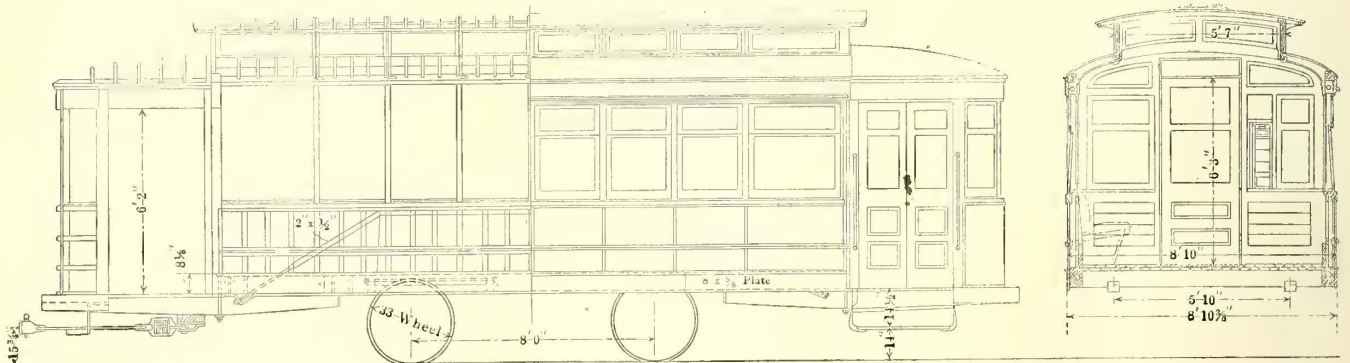
Length over body.....	21 ft. 0 in.
Length over all.....	32 ft. 2 in.
Length over panels at sills.....	8 ft. 10 in.
Width over all.....	9 ft. 0 in.
Height from top of rail to top of trolley board.	11 ft. 8 in.

moldings, etc., is in plain oak and the side linings are No. 14 sheet steel held in place with screws. Three-ply bird's-eye maple veneer decorated on the face is used for the ceiling. All metal trimmings are of bronze held in



City Car for Sterling, Dixon & Eastern

place by oval-headed screws. Reference to the dimensions earlier presented will show that the extreme width of this car permits of a very comfortable seating arrangement. There are on each side of the car six reversible-back cross seats 34 in. long, a clear aisle space 22 in. wide remaining. At each of the four corners of the car body is a longitudinal seat 34 in. long. The 5-ft. 7-in. platforms not only render the car capable of loading and unloading quickly, but also on days of heavy traffic furnish a considerably larger standing space than ordinarily is found on cars of this size. The interior equipment of the car includes push buttons con-



Framing and Elevations of City Car for Sterling, Dixon & Eastern

The bodies are mounted on St. Louis Car Company No. 46 trucks carrying two GE-78-A motors. The wheels are 33 in. in diameter and the wheel base is 8 ft.

The interior finish of the cars, including the doors, sash,

connected with call bells in each vestibule and three circuits of five lights each. All side and end windows have curtains of Pantasote hung on spring rollers with the Curtain Supply Company's No. 86 pinch-handle fixtures. The cars are

heated by Detroit Jewel stoves. The specifications for these cars were prepared by the Columbia Construction Company, of Milwaukee, engineer. Acknowledgment is made to E. E. Downs, general manager of the Sterling, Dixon & Eastern road, for the foregoing description.

**CENSUS REPORT ON ELECTRIC RAILWAYS**

On Monday of this week the United States Census Bureau made public its first bulletin with statistics of the street and electric railways of this country, based on the census taken last year. The statistics comprise the roads in continental United States; that is, they are exclusive of Alaska, Hawaii, Philippine Islands and Porto Rico.

The statistics relate to the years ended Dec. 31, 1907, and June 30, 1902. The totals include reports of operating and lessor companies and a considerable number of electric light plants operated in connection with electric railways, but do not include reports of railways under construction during the census years; nor do they include reports of financing companies which were not engaged in actual operation of railways or light plants.

	1907.	1902.	Per cent of increase.
Number of operating and lesser companies	1,236	987	25.2
Length of line (first main track), miles	25,547.19	16,651.58	53.4
Total length of single track, miles	34,403.56	22,576.99	52.4
Number of cars, total	83,641	66,784	25.2
Passenger	70,016	60,290	16.1
All other	13,625	6,494	109.8
Number of power houses	827	805	2.7
Steam and gas engines (including turbines), number	2,552	2,351	8.5
Horse-power	2,384,518	1,300,958	83.4
Water wheels, number	228	160	42.5
Horse-power	91,961	49,303	86.5
Total kilowatt capacity of dynamos	1,727,030	898,362	92.2
Output of stations, total kw-hours	4,759,130,100	2,261,484,397	110.4
Passengers carried, total	9,533,080,766	5,836,615,296	63.3
Fare	7,441,114,508	4,774,211,904	55.9
Transfer	1,995,658,101	1,062,403,392	87.8
Free	96,308,157		...
Total car mileage (passenger, express, freight, etc.)	1,618,343,584	1,144,430,466	41.4
<i>Condensed income account, operating companies.</i>			
Earnings from operation	\$418,187,858	\$247,553,999	68.9
Income from other sources	111,556,396	2,950,628	291.7
Gross income	429,744,254	250,504,627	71.6
Operating expenses	251,309,252	142,312,597	76.6
Net earnings (earnings less operating expenses)	166,878,606	105,241,402	58.6
Gross income less operating expenses	178,435,002	108,192,030	64.9
Deductions from income (taxes and fixed charges)	138,094,716	77,595,053	78.0
Net income	40,340,286	30,596,977	31.8
Dividends (operating companies only)	25,558,857	15,882,110	60.9
Surplus	14,781,429	14,114,867	0.5
<i>Capitalization, operating and lessor companies.</i>			
Capital stock authorized, par value	\$2,508,054,336	\$1,529,199,589	64.0
Capital stock outstanding, par value	2,097,708,856	1,315,572,960	59.5
Dividends on stock	53,589,399	33,039,171	62.2
Bonds authorized, par value	2,319,220,837	1,341,429,727	72.9
Bonds outstanding, par value	1,677,063,240	992,709,139	68.9
Interest on bonds	71,468,788	43,578,961	64.0
Total par value stock and bonds outstanding	3,774,772,096	2,308,282,099	63.5
<i>Employees and wages, operating companies.</i>			
Salaried employees, number	11,700	7,128	64.1
Salaries	\$12,909,466	\$7,439,716	73.5
Wage-earners, average number	209,729	133,941	50.9
Wages	\$138,081,633	\$80,770,449	71.0

\*Not reported separately.

†Includes \$3,255,618 income from interest on bonds and dividends on stock of other electric railways.

‡Includes permanent and other investments, such as securities of other electric railways, treasury stocks and bonds, gas plants, etc.: 1907, \$388,394,092; 1902, \$152,513,997.

The final report for 1907 will contain an analysis of the above totals and present detail statistics for other phases of the industry.

The following averages, based upon the figures given above, were also made public:

	1907.	1902.
Capital liability per mile of track	\$109,719	\$102,240
Average horse power per engine	934	353
Average horse-power per water wheel	493	308
Kilowatt capacity of engines and water wheels	1,847,453	1,006,623
Kilowatt capacity of dynamos	1,727,030	898,362
Kilowatt consumption per car mile	2.94	1.97
Fare passengers per mile of track	216,286	211,404
Fare passengers per car mile	4.60	4.17
Income per car mile	25.8c.	21.6c.
Average yearly salary of officials	\$1,103	\$1,044
Average yearly wages of wage-earners	\$658	\$604

**MASSACHUSETTS STREET RAILWAY ASSOCIATION MEETING**

The regular monthly meeting of the Massachusetts Street Railway Association was held at Young's Hotel, Boston, on Jan. 13. The speaker of the evening was Edward Hungerford, of the Brooklyn Rapid Transit Company, his subject being, "The Entertaining Proposition of Carrying on a Transportation Business at a Loss." Mr. Hungerford discussed the Cleveland situation and said in part:

Cleveland had been told that the millennium and the Municipal Traction formed a team that trotted well in harness. Mayor Johnson was the charioteer. The Cleveland Electric Railway Company had offered as high as seven tickets for a quarter, but what was that?

The Municipal Traction on the day of its inauguration in April last carried every one free on its cars from midnight until midnight. The town became a delirium of traction joy. Free rides to-day, 3-cent rides to-morrow. Hurrah for Johnson! If he could only live to 150 and be Mayor of Cleveland all that while there might be free bread, free rent, free clothing. Who knew?

Within a month the joy in Cleveland was less delirious, appreciably less. Some of the folk who had shouted the praises of Johnson most joyously had the audacity to criticize the service given the running partner of the millennium. Certain newspapers allowed that the cars had been weeded out more than a little. Those energetic preservers of the public weal—the boards of trade and the chambers of commerce—passed resolutions that might have sent cold chills down the backbone of any other operating man. Johnson only smiled his sentimentous smile. "Cleveland Electric," he whispered, and straightway proceeded in another cut of schedules.

You know there is nothing so potent in public opinion as the private comfort of the traveling passenger. These comforts, infinitely multiplied in large cities, go far toward making that intangible, all-powerful thing that we have learned to know as "public opinion." When Johnson's adherents had to hang on straps for the first time in their lives, when they had long waits at street corners for cars that seemingly never came, "public opinion" in Cleveland began slowly and surely to change. The Mayor might talk himself black in the face. The Utopia that he had promised had apparently set in as an era of discomfort. Clevelandites began asking one another: "What is Utopia? Does the dictionary give the correct meaning to millennium?"

After all, as a street railroad proposition, what else could Tom Johnson do? When after all his talkings he was confronted with a necessity for action there must have been only three paths open to him:

In the first he could give Cleveland as good service as the old company had given it and at a 3-cent fare for a time. I say "for a time" because under the lease of the remarkable contract that he made with the Cleveland Electric upon taking over its property was a clause that provided that in case the Municipal Traction—the Johnson company—did not pay its rent promptly the property should revert in 90 days to its owners for operation. It is this clause that has caused the recent upset in the joyous Johnson program and indirectly the appointment of receivers by the United States courts for the Municipal Traction Company. That was plainly an impossible path from the outset. Johnson had no desire to run at a loss, at least so great a loss as to cause the bonanza to slip from his fingers. The first path was closed.

The second was also *empassé*. By it he could back down and admit the truth—the impossibility of profit in a 3-cent fare—and continue to charge the same rates of fare as the old company. But Mayor Johnson has never relished a diet of his own words and he saw "failure" plainly written at the head of that path.

The third was obviously the only course that he might choose. He could skimp in the operation of the line, cut its service and expenses and perhaps crawl along on that basis. As to the efficacy of that plan ask those Clevelandites who hung on straps for the first time in the history of the town during the past year. Johnson did not hesitate to cut out

whole routes and streets where traffic was still in a state of development.

"I am not going to run lines that don't pay," was all that he would say.

Then came the strike. The Cleveland Electric had promised its men a 2-cent-an-hour raise if it obtained a new franchise and the deal by which it secured a longer lease of life in Cleveland streets in consideration of its handing its property over to Johnson's Municipal Traction for operation was considered a new franchise by the men. Johnson did not see it that way. He refused the men's demands and Cleveland went through the unpleasantness of a bitterly fought street-car strike for the first time in its history. Johnson blamed the entire business upon the Cleveland Electric. His sole regret was that there were no new forms of execration that he might heap upon "that crowd."

Johnson handled that strike like any sin-filled private corporation might have handled it and won a partial victory. To accomplish that partial victory he had the entire police force and machinery of the city government at his right hand. After the strike was over it made a fine excuse for both poor service and poor earnings for many months.

But the strikers had their revenge, at least Johnson thinks that they did, and he admits that the Cleveland Electric "crowd" was probably at the bottom of the business. They dug an initiative and referendum law out of the State statute books and Johnson might have said: "How sharper than a serpent's tooth is initiative and referendum." For it is a matter of actual fact that the Hon. Tom L. Johnson himself was largely responsible for the placing of that very statute upon the laws of Ohio.

Some one—no one seems to know or is willing to tell what one—started the initiative and referendum against the whole Johnson program, Municipal Traction, new franchises, leases from the helpless Cleveland Electric and all. Johnson raved and doubted the sincerity of the movement. The movement progressed despite that. Its progress was so certain that when the matter came to vote on Oct. 22 last, despite the frantic efforts of Mayor Johnson, the Mayor's cause was voted down. It was the first time that he had ever been beaten in a Cleveland election. He took his medicine hard. The Johnson smile disappeared. Instead there appeared a pathetic and truly characteristic philippic from the Mayor to the effect that he had sacrificed his entire personal fortune to the cause of "the peepul." But even that *coup d'etat* did not receive the welcome from the galleries that Tom Johnson might have expected. Johnson days beyond a doubt were past days. There is no king quite as dead as a dead king.

### CHANGE IN MILK RATES IN MICHIGAN

Prior to July 6, 1908, the Detroit United Railway carried milk at a flat rate of 10 cents per can between any points within 25 miles of Detroit. This rate applied not only to milk, but to cream shipped for use in making butter and ice cream. After a careful consideration of the cost for handling milk and cream the Detroit United Railway adopted a new tariff, raising the rates and basing them on the mileage.

In the judgment of the management of the road the increase in milk rates as compared with the rates charged by competitive steam lines was justified because of the comparative excellence of the service. In collecting milk the electric cars made frequent stops for picking up a few cans and thereby saved the farmers teaming. Platforms and shelters were built for the protection of the milk in hot weather and the construction and maintenance of these platforms and shelters were an expense for the company. Other expenses in connection with operation, especially for labor, showed a tendency to increase gradually and the city of Detroit had demanded a tax of \$1 per car per round trip for the privilege of permitting the express cars to be operated in and out of the city. The longest haul for milk made by the electric railway was 60 miles as compared

with a haul of 150 miles made by some of the steam lines.

A careful consideration of these conditions seemed to justify the electric road in issuing a tariff calling for an increase in rates over the flat charge of 10 cents per can. Accordingly "Tariff No. 17" was issued making the rates as follows and classifying the shipments into milk and cream or butter fat:

Distance.	Milk.		Cream or butter fat.	
	In cents per can 10 gal. or less.	In cents per 100 lb. carrier 10 gal. or less.	In cents per can 10 gal. or less.	In cents per 100 lb. carrier 10 gal. or less.
1 to 30 miles inclusive.....	15	15	25	25
31 to 60 miles inclusive.....	20	20	35	35
61 to 90 miles inclusive.....	30	30	45	45
91 miles and over.....	40	40	55	55

This tariff sheet stated that "under this tariff the rates named will apply on milk, cream or butter fat in patent cans said to contain 10 gal. or less, or in bottles packed as carriers weighing not to exceed 100 lb. and will be the rates for one full can or carrier and the return empty.

"Milk, cream or butter fat in cans or carriers will be carried only on regular tickets, which must be produced in advance and accompany the cans or carriers in all cases.

"Cream or butter fat will be classified as such when it has been separated from milk by a separator or other process. The rates named on milk will also apply on skimmed milk or buttermilk."

One reason why it was found advisable to vary the rates as between milk and cream or butter fat was that a tendency had been shown by claimants for losses to put in claims for the value of cream when milk only had been lost. The settlement of such claims caused considerable friction in arriving at proper damage amounts.

The reasons stated for adopting a new tariff at slightly increased rates were understood by the patrons of the Detroit United Railway and no general complaint was made; but on Sept. 24, following an order of the Michigan Railroad Commission, the electric railway company issued tariff No. 18 in which the charges were given as follows:

Distance.	Milk.		Cream or butter fat.	
	In cents per can 10 gal. or less.	In cents per 100 lb. carrier 10 gal. or less.	In cents per can 10 gal. or less.	In cents per 100 lb. carrier 10 gal. or less.
1 to 20 miles inclusive.....	10	10	20	20
21 to 30 miles inclusive.....	15	15	25	25
31 to 60 miles inclusive.....	20	20	35	35
61 to 90 miles inclusive.....	30	30	40	40
91 miles and over.....	40	40	50	50

At the request of the commission these rates were to continue, unless prior to Jan. 10, 1909, complaint thereof should have been made to the commission, calling for a rehearing based on that complaint and showing that the rates were not satisfactory either to the shippers or the railroad company. The latter schedule of rates was adopted temporarily because the commission is treating this question of rates in a fair and impartial manner and because it is awaiting action on a similar subject by the Interstate Commerce Commission. As the Interstate commission has not issued its decision, the Michigan commission granted an extension of 30 days from Jan. 10.

The Detroit United Railway Company did not approve this second tariff and so placed itself on record before the commission. It is stated that at an informal conference before the commission complainants had objected to the earlier rate charged by steam roads as too high and the defendants, the steam railroads, contended that the existing rates were too low; therefore the commission made the arbitrary rates adopted and ordered them put into effect on both steam and electric lines so that a test might be given to determine what charges were necessary in all fairness to both sides.



# Construction News

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

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

## RECENT INCORPORATIONS

**Helena Street & Interurban Railroad, Helena, Ark.**—This company has been incorporated for the purpose of establishing an electric street railway in Helena. Capital stock, \$25,000. Officers: J. W. Burks, president; Charles S. Henry, vice-president, and J. W. Vineyard, secretary and treasurer. [E. R. J., Dec. 12, '08.]

**\*Eldorado Springs Railway, Denver, Col.**—This company has been incorporated to construct an electric railway from the springs up the mountain side on the north. In winding backward and forward up the steep ascent an elevation of several hundred feet will be attained in going 1½ miles, the approximate length of the line. At the summit of the mountain the company is establishing an amusement park. Incorporators: W. W. Seaver, C. W. Clark and Frank Hawley.

**\*Mount Hope Traction Company, Chicago, Ill.**—This company has been incorporated in Illinois to construct and operate street railways. Capital stock, \$1,000. Incorporators: Samuel P. Parmly, Jr., T. Hood Little and Victor E. Lindle.

**\*Dubuque, Illinois & Wisconsin Interurban Railway, Dubuque, Ia.**—This company has been chartered to construct a standard gage road from Dubuque, Ia., to East Dubuque, Ill.; Fairplay, Cuba City and Platteville, Wis., a distance of 30 miles. The motive power will be both steam and gasoline. Victor H. Stevens, president of the company, states that it is possible that construction will be commenced in July. The repair shops will be erected at Dubuque. Capital stock authorized, \$1,500,000. Officers—Victor H. Stevens, president; Dr. J. R. Guthrie, vice-president; S. M. Langstaff, secretary; J. J. Nagle, treasurer, all of Dubuque.

**\*Galesburg & Rock Island Traction Company, Rock Island, Ill.**—This company has been incorporated for the purpose of building an electric road from Galesburg through the counties of Knox, Warren, Mercer and Rock Island to the city of Rock Island. Headquarters, Rock Island. Capital stock, \$10,000. Incorporators: Frank H. Clark, Springfield, Ohio; Alfred C. McWhinney and Robert P. McGeehan, Kansas City, Mo.; Earle H. Field, Monmouth, Ill.; R. V. Field, Galesburg, Ill., and E. Woodward, Warren Everett and J. Elliott, Chicago.

**Kansas City, Olathe, Ottawa & Iola Railway, Topeka, Kan.**—This company has applied for a charter to build an electric railway from Kansas City, Kan., south to Iola, a distance of 115 miles. Capital stock, \$5,000,000. Incorporators: J. D. Bowerstock, Lawrence; Robert A. Barr, Kansas City, Mo.; Hugh A. Holmes, Kansas City, Kan.; W. S. Fallis, Garnett; C. H. Estabrook, Ottawa; J. P. Harris, Ottawa; Frank Hodges, Olathe; James O. Rodgers, Iola; J. I. Wolfe, Burlington; W. M. Riger, Burlington. [E. R. J., Dec. 12, '08.]

**St. Louis, Creve Cœur & Western Railway, Clayton, Mo.**—This company has been incorporated for the purpose of building an electric railway from the city limits of St. Louis to Creve Cœur Lake. It is stated that construction will be started by March 1. Three years ago a franchise was granted to a company known as the St. Louis, Fern Ridge & Western Railway to use the same route. Several of the stockholders in the old company are stockholders in the new one, which is practically a reorganization of the old company. The old franchise will be transferred to the new company. The company will have 14 miles of double track. Capital stock, \$140,000.

**Goldsboro (N. C.) Traction Company.**—This company has been chartered in North Carolina to construct and operate an electric street railway in and around Goldsboro to the limit of 50 miles in any direction out of the city. There is already about one mile of the track ready, and the purpose is to have about 2½ miles in operation out to a park by June 1. Capital stock authorized, \$150,000; issued, \$45,000. Incorporators: A. T. Oliver, J. H. Trent, S. L. Blackburn and J. S. Oliver. [E. R. J., Sept. 26, '08.]

**\*Fulton Chain & Beaver River Railroad, Buffalo, N. Y.**—This company has been incorporated to operate a road in Herkimer county by steam or electric power, 9 miles long, from Fulton Chain, on the Mohawk & Malone Railway, to Otter Lake. Capital stock, \$90,000. Directors: Lyon De Camp, Fulton Chain; W. L. Marcy, H. W. Sprague and W. M. Wheeler, Buffalo, and R. J. Gaffney, Bradford, Pa.

**\*Columbia Railway, Light & Power Company, Portland, Ore.**—This company has recently been incorporated in

Oregon with a capital stock of \$50,000. Incorporators: Goodwin A. Young, Ray W. Lang and N. A. Perry.

## FRANCHISES

**\*Mesa, Ariz.**—Application has been made to the Town Council by Dr. A. J. Chandler for a franchise to build and operate a street railway on Main and MacDonald Streets.

**Sandpoint, Idaho.**—The City Council has granted to A. Filson, F. M. Molyneaux, J. F. McBride, J. M. Prater, J. B. Southmayd and H. C. Olney a 50-year franchise for a street railway in Sandpoint. The railway must be in operation by Dec. 1, 1909, otherwise the promoters forfeit a \$5,000 bond. [E. R. J., June 6, '08.]

**Chicago, Ill.**—The City Council has passed an ordinance authorizing the Calumet & South Chicago Railway to build an extension in South Chicago Avenue, between Vincennes Avenue and South Park Avenue; also an ordinance permitting the company to build a single line of track on 115th Street from Michigan Avenue to Halsted Street.

**Chicago, Ill.**—The local transportation committee of the Chicago City Council has recommended the ordinance of the Kensington & Eastern Railroad. This road is an 8-mile connection between the Illinois Central Railroad at Pullman and the Chicago, Lake Shore & South Bend Railway at Hammond, Ind. It will be electrically equipped and not only will furnish an outlet into Chicago for the Chicago, Lake Shore & South Bend cars, but will give the Illinois Central an entrance to the Gary manufacturing district. The franchise recommended is for 20 years and the committee decided that the new road could not place more than six tracks across a street and also must pay as compensation at the switch-track rate of \$1 a foot for 50 ft. and 50 cents a foot for the remainder. It is stated that this compensation will not amount to more than \$3,000 a year.

**Paxton, Ill.**—The City Council has granted the Chicago, Kankakee & Champaign Electric Railway a franchise to operate a line on Railroad Avenue. The road, when completed, will be 75 miles in length and will extend from Kankakee to Champaign.

**Bluffton, Ind.**—Elections have been ordered by the Commissioners of Wells and Adams Counties to be held in four townships Feb. 8, for subsidies amounting to \$34,000, asked by the Bluffton, Berne & Celina Traction Company. Franchises have been granted in Celina, Ohio, the eastern terminal, and at Berne, the midway point. The survey has been completed and the right of way has been taken for three-fourths of the mileage. [E. R. J., Jan. 2, '09.]

**Jackson, Miss.**—The application of R. L. Bradley, R. V. Powers and W. Q. Cole for a franchise for a belt line in Jackson has been rejected by the Board of Aldermen. [E. R. J., Dec. 26, '08.]

**Clinton, Mo.**—Application has been made to the City Council by the Western Missouri Interurban Railway for a franchise to build an electric railway through Clinton. The line is projected from Odessa through Warrensburg and Greenfield to Clinton, a distance of 75 miles. George S. Halliday, Clinton, president.

**\*Kansas City, Mo.**—James A. Stewart has applied to the Board of Commissioners of Wyandotte County for a franchise for a line to start at Graystone Avenue, at the State line, and follow the crest of the hill south of the Kaw River and the Junction cemetery. The distance is 4 miles.

**New York, N. Y.**—The Appellate Division of the Supreme Court has granted the application of the Public Service Commission for an extension of time until Oct. 15, 1911, to begin work on the Broadway-Lafayette Avenue subway. Under the previous ruling it would have been necessary to begin work before Jan. 25 to make valid the consent for the construction of the loop.

**Ottawa, Ont.**—The Toronto, Niagara & Western Railway will apply at the next session of the Canadian Parliament for an extension of time to build lines between Toronto and Niagara Falls, Toronto and Windsor and St. Catharines and Port Colborne, and for power to increase the bond issue. The line between Toronto and Niagara Falls will follow the route of the present power transmission line between these cities.

**Astoria, Ore.**—A franchise has been granted by the County Council to the Oregon Coast Railway to use the bridges across Youngs Bay and the Lewis and Clark River in the construction of its electric railroad to Seaside. [E. R. J., Oct. 10, '08.]

**Honesdale, Pa.**—The City Council has granted the Lackawaxen Valley Railway a 75-year franchise for a street railway in Honesdale. The Lackawaxen Valley Railway is the successor to the Honesdale & Hawley Railway, which was formed for the purpose of constructing an electric railway from Seeleyville to Hawley, a distance of 11.5 miles.

**Lansdowne, Pa.**—The Sharon Hill & Upper Darby Street Railway, which is a subsidiary company of the Interstate Railways Company, has made applications before the Borough Councils of Alden and Lansdowne boroughs for a franchise granting a double-track right of way from the Chester pike and Clifton Avenue, Sharon Hill, through the boroughs of Sharon Hill, Collingdale, Alden, Lansdowne and the township of Upper Darby to a terminus at Sixty-ninth Street, Philadelphia. The construction of this road will mean a through and direct line from Sixty-ninth Street to Wilmington, Del., as the connections will be made with the Chester Traction Company at Sharon Hill.

**Meyersdale, Pa.**—A franchise has been granted by the Council of the borough of Garrett to the Pennsylvania & Maryland Street Railway which permits the company to use three streets in the town and thus continue the line to Berlin. The company has a line in operation from Salisbury, through Meyersdale to Garrett.

**Georgetown, S. C.**—The City Council has granted H. C. Case, president of the Georgetown Electric Company, a franchise to build a street railway in Georgetown. It is said that Mr. Case will take up the construction of the road during this year. [E. R. J., Aug. 15, '08.]

**\*San Marcos, Tex.**—F. F. Beck, Buffalo, N. Y., representing an Eastern syndicate which contemplates building an interurban line from Austin to San Antonio, has applied to the City Council for a franchise over one of the through streets running east and west for the purpose of running their line through the city. The company agrees to construct a belt line in the city if the proper franchise is given, also to erect its power plant in San Marcos if a suitable site is donated.

**\*Wichita Falls, Tex.**—Edgar Scurry, Henry Sayles and N. Henderson are reported to have asked the City Council for a 50-year franchise to build and operate an electric street railway in Wichita Falls.

#### TRACK AND ROADWAY

**Bentonville, Ark.**—The citizens of Bentonville in a mass meeting on Jan. 7 instructed the committee of five, of which Mayor A. W. Morris is chairman, to close a contract with the Western Surety & Investment Company, Minneapolis, Minn., to build an electric railway from Joplin, Mo., to Bentonville, then to Gentry, Tarrytown, Springdale and back to Bentonville. The work upon the new railway is to begin immediately after the contract is signed, and the Western Surety & Investment Company is guaranteed an appropriation of \$55,000 by citizens here as soon as the line is completed.

**Pacific Electric Company, Los Angeles, Cal.**—This company has begun the construction of a new line around the bay from Wilmington to connect with the tracks of the Inter-Urban Railroad at the north city limits of San Pedro. The work is being done under a franchise granted some time ago by the city of Wilmington. The line will be about 3 miles in length.

**Ocean Shore Railway, San Francisco, Cal.**—This company has laid 28 miles of new track during the past year. Twenty miles were built southerly from San Pedro terrace, and 1.5 miles north of Folger at the Santa Cruz end. About 26 miles of road remain to be completed before reaching Santa Cruz. Of this distance there are 6.5 miles already graded, and of the balance there are 2.5 miles of heavy bluff work, 1.5 miles of easy bluff work, and 16 miles of light work over level ground. The company plans to have the line to Santa Cruz in operation within the next four months.

**Connecticut Company, Hartford, Conn.**—This company has completed the construction of an extension from Griswoldville to Rocky Hill, a distance of 2½ miles. It is the intention of the company to extend this new line to Middletown.

**Lebanon (Conn.) Street Railway.**—L. E. Livermore, president of this company, writes that the directors have not yet decided when construction will begin on the projected road, which is to extend from Yantic to South Manchester. By the construction of this link Hartford and Norwich will be practically connected by electric railway lines. The length of the road will be 28 miles. The overhead trolley system will be installed. Capital stock, authorized, \$800,000. L. P. Smith, Lebanon, secretary and treasurer. [S. R. J., Jan. 26, '07.]

**People's Traction Company, Galesburg, Ill.**—At a meeting of the directors of this company, the authority of the board was given for proceeding immediately with the extension of the line from Galesburg to Galva. It is said that immediate steps will be taken toward securing the right-of-way and necessary franchises. The line will be 24 miles long.

**Central Railway Company of Iowa, Clinton, Ia.**—The Electric Railway Journal is advised that this company ex-

pects to begin the construction of its projected standard gage interurban line in May. The road will connect the following cities: Clinton, Elvira, Bryant, Goose Lake, Charlotte, Delmar, Maquoketa, Hurstville, Dugan, Garry Owen, Cascade, Rockdale and Dubuque. The system will be 83 miles in length and will be operated by electricity, both catenary construction and third rail being used. Officers: Thos. J. Wilcox, Clinton, president and general manager; L. E. Wiley, Chicago, Ill., vice-president; D. L. Wilcox, Clinton, secretary; M. A. Wilcox, Clinton, treasurer.

**Davenport, Maquoketa & Dubuque Railway, Maquoketa, Ia.**—O. M. McCaffrey, Maquoketa, writes it is the plan of this company to begin work on its projected interurban line this Spring. It will be 90 miles in length and will connect Davenport, Eldridge, Elwood, Grand Mound, Maquoketa, Andrew, La Motte and Dubuque. The motive power will be electricity and it is intended to install catenary construction. The power station and repair shops will be located in Maquoketa. Power for various purposes will be furnished to towns along the route. [S. R. J., Nov. 2, '07.]

**Paris & Mt. Sterling Railway, Mt. Sterling, Ky.**—The Electric Railway Journal is advised that this company will not be ready for some time to begin construction on its proposed railway, which is to be established between Mt. Sterling, North Middletown and Paris. The line will be standard gage and will be 23 miles in length. Capital stock, authorized, \$100,000. Officers: John T. Collins, North Middletown, president; R. J. Neeley, Paris, vice-president; H. C. McKee, Mt. Sterling, secretary; Robert Talbott, Paris, treasurer.

**Oakland, Swallow Falls & Uniontown Electric Railway, Oakland, Md.**—This company has located and surveyed the route for its projected railway. It will be a double track, standard gage electric road, from Oakland, Md., to Uniontown, Pa., with a single track, lateral branch from Swallow Falls down the river about two miles, to the hydro-electric plant, also a single track, lateral branch, from Cranesville, on the main line, to Kingwood, W. Va. The road will be about 50 miles in length. A hydro-electric power plant will be erected at a point about 6 miles north of Oakland. It has not yet been decided when construction will begin. Power will be furnished both for lighting and heating. Capital stock, authorized, \$150,000. Officers: A. G. Sturgiss, president; Truman West, vice-president; Bowie Johnson, secretary; James D. Hamill, treasurer; H. P. Tasker, general manager, all of Oakland; J. B. Hogg, Connellsville, Pa., chief engineer. [E. R. J., July 18, '08.]

**Springfield, Mass.**—Col. Stanhope E. Blunt, commandant at the United States armory, Springfield, has asked for an appropriation from Congress with which to build an electric railway for freight purposes. At present trucking forms a large item in the cost of manufacture, and to reduce this a line connecting the water shops plant with the armory, and also connecting both with the Wilbraham road freight station, is desired.

**Mexico (Mex.) Tramways.**—The secretary of communications has just approved the plans of this company for the electrification of its Peñon line, which at the present time is being operated by mule cars. The line begins at the Zocalo and extends as far as the mineral springs and baths at Peñon.

**Kansas City & Kansas Southwestern Railroad, Kansas City, Mo.**—A mortgage for \$12,000,000 has been filed in Kansas City, Kan., by W. Laming, Tonganoxie, Kan., president of the Kansas City & Kansas Southwestern Railroad in favor of the Carnegie Trust Company, of New York City. It is to provide funds for the construction of electric railways between Kansas City and Topeka, by way of Tonganoxie and Lawrence, and the building of an electric railway from Lawrence to Independence, Kan. [S. R. J., March 28, '08.]

**Nebraska Traction & Power Company, Omaha, Neb.**—The General Construction Company, W. D. Crist, manager, Omaha, Neb., is building a 10-mile catenary line from South Omaha toward Lincoln, Neb. Material for this line has been purchased from the Ohio Brass Company. On the completion of the road the cars of the new line from Lincoln to Omaha will enter Omaha over the tracks of the Omaha & Council Bluffs Street Railway. [E. R. J., Dec. 5, '08.]

**Moncton, N. B.**—It is stated that the municipality of Moncton will apply at the coming legislature for power to construct and operate an electric railway in the city of Moncton and in the parishes of Moncton and Shediac. John S. McGee, City Clerk.

**Atlantic City & Suburban Railway, Atlantic City, N. J.**—Announcement is made that this company will build a new \$250,000 bridge over Great Egg Harbor Bay, extending from Somers Point to Ocean City and rendering it possible

to carry passengers from Florida Avenue and the Boardwalk or Absecon to Ocean City. It is said that a contract will be awarded as soon as plans and specifications can be drawn and accepted by the Cape May authorities.

**New York, N. Y.**—The Public Service Commission of the Second District has dismissed the application of the New York, New Haven & Hartford Railroad and the Harlem & Port Chester Railroad for the consent of the commission to change its motive power on the Harlem & Port Chester Railroad from steam to electricity. The application is dismissed on the ground that the companies are authorized to make such change without the consent or approval of the commission.

**Oneonta, Charlotte Valley & Cobleskill Railroad, Charlottesville, N. Y.**—C. G. Payne writes that this company has not as yet completely financed its road. The promoters wish to communicate with parties who would be willing to take the project in hand and finance it. The route as decided upon will touch the following cities: Oneonta, Davenport, South Worcester, Charlotteville, Summit, Richmondville, Cobleskill and several smaller towns. Officers: C. G. Payne, Charlottesville, president and general manager; C. G. Mallette, Cobleskill, vice-president; F. W. Olmstead, South Worcester, secretary; B. W. Hoye, Oneonta, treasurer.

**Rochester, Corning & Elmira Traction Company, Rochester, N. Y.**—Announcement is made that this company will commence the construction of the first section of its proposed line between Rochester and Conesus Lake on April 1. The work will be done by the Southern Construction Company. It is planned to start the work at two points, Avon and Rush, with gangs working north and south, and with a gang working south from Rochester. It is hoped to have the main line past Dansville and the stub from Dansville to Hornell completed in 1910. With the completion of the first section, work is to be begun on the second section, from Conesus Lake to Dansville. On the south end of Conesus Lake will be built the power plant, car house and a fireproof repair shop covering an area of 200 ft. x 250 ft., and a two-story office building for headquarters of the company on a site 50 ft. x 80 ft. The power plant is to contain three generating units of 1500 kw with provision for the installation of a fourth unit. Officers: John Hofman, Rochester, president; Samuel B. Williams, Rochester, treasurer; Louis H. Whitebeck, secretary. [E. R. J., Dec. 12, '08.]

**Burgrahaw Interurban Company, Burlington, N. C.**—It is announced that this company has awarded the general contract for building its line to the Interurban Company, 25 Broad Street, New York. The line will connect Burlington, Graham and Haw River, and will be eight miles in length. James W. Murray, president. [E. R. J., Nov. 28, '08.]

**Toledo & Michigan Electric Railway, Toledo, Ohio.**—The Electric Railway Journal is informed that this company has graded its line for a distance of 32 miles. A number of concrete culverts and bridge abutments have been built and 14 miles of fence have been put in place. The road has not yet been completely financed. It will be 60 miles in length, extending from Adrian through Clayton, Hudson, Pittsford, Osseo, Hillsdale, Janesville, Quincy and Coldwater. The motive power will be electricity. The company expects to furnish power for lighting. Capital stock, authorized, \$1,500,000. Bonds have been issued to the amount of \$1,500,000. Headquarters, 244 Ohio Building, Toledo. Officers: Peter P. Duket, Toledo, president and general manager; L. E. Goodrich, Hillsdale, vice-president; J. W. Hellem, Adrian, secretary; Dr. C. H. Lards, Adrian, treasurer.

**Morrisburg Electric Railway, Morewood, Ont.**—C. M. Willard writes that this company has plans under consideration for beginning construction on its projected line this spring. The majority of the right-of-way has been secured. The road will be standard gage, 70 miles in length and will extend from Morrisburg to Ottawa, through the following cities: Williamsburg, Winchester, Chesterville, Morewood, Orwan, Kenmore and Metcalf. The overhead trolley system will be installed on the line. The power plant and repair shops will be erected in Morrisburg. Headquarters, Box 45, Morewood. Capital stock, authorized, \$1,000,000; issued, \$200,000. Bonds, authorized, \$800,000. Officers: C. M. Willard, president and general manager; W. M. Louchridge, vice-president; Bradford Louchridge, secretary; J. H. Louchridge, treasurer, all of Morewood; Robert Merkley, Williamsburg, superintendent; G. Brown, Morrisburg, chief engineer. [E. R. J., June 20, '08.]

**Windsor Tunnel & Lake Erie Company, Windsor, Ont.**—George Bouteiller, Walkerville, Ont., writes that this company expects to begin construction about July on its proposed railway, which is to connect Windsor, Sandwich, West Vereker, New Canaan, McGregor, Huron and Oxley. From 26 to 30 miles of standard gage single track will be built.

At the present time the company is at work securing franchises and will shortly apply for a charter. Officers: R. A. Bailey, Detroit, Mich., president; Dr. J. A. Smith, Windsor, vice-president; J. G. Leggatt, Laing Block, Windsor; Walter Boug, Windsor, treasurer. [E. R. J., Oct. 31, '08.]

**Belleville & Reedville Railroad, Belleville, Pa.**—F. W. Warner writes that it has not yet been definitely decided when construction will be commenced on this standard gage line, which is to connect Belleville and Reedville, a distance of nearly 9 miles. It is probable that the company will establish a park along the line. Capital stock, authorized, \$100,000. Officers: L. M. Yoder, Belleville, president; S. M. Patterson, Avondale, vice-president; F. W. Warner, Belleville, secretary and treasurer. [E. R. J., Aug. 15, '08.]

**Lehigh Valley Transit Company, Allentown, Pa.**—R. P. Stevens, president of this company, writes that 5 miles of city track extensions will be built this spring. The company, together with the county, will also construct a \$125,000 concrete bridge.

**Pittsburg & Westmoreland Railway, Pittsburg, Pa.**—At a meeting of the stockholders of this company it was decided to construct a new line from Herminie to West Newton. The contract is to be let in a few weeks. It was also decided to take over the rights-of-way of the Donora-Eldora Street Railway, which was organized for the purpose of building a line between Donora and Eldora. [E. R. J., Dec. 26, '08.]

**Galveston & Houston Traction Company, Galveston, Tex.**—This company and five steam railroads have signed a joint contract to build a causeway connecting Galveston Island with the mainland. The causeway will be 2 miles long, across Galveston Bay, and about half will be built of concrete, to cost nearly \$2,000,000. It will have four railroad tracks, a wide wagonway and foot passage. It is expected that the construction of this road will be commenced simultaneously with the building of the causeway. The line will connect Galveston and Houston, a distance of about 50 miles.

**Texas Union Traction Company, Clarksville, Texas.**—W. B. Rollins, Beals Building, Kansas City, Mo., advises that this company has a charter to construct a number of electric railways in Texas, among which are the following: From Paris to Ennis, a distance of 124 miles; from Texarkana to Sherman, 154 miles; from Texarkana to Fort Worth, 215 miles; from Paris to Cleburne, 155 miles. It also has the right to build extensions from any city along any of the proposed lines into the country, a distance of 20 miles from the main line. It is the intention of the company to build one of these spurs first; this proposed spur is to extend from Paris through Deport to some other small town in that vicinity. Officers: C. P. Moore, Longfellow, president; A. A. St. John, vice-president; John T. Upchurch, Clarksville, secretary and treasurer.

**Spokane & Inland Empire Railroad, Spokane, Wash.**—It is stated that this company is planning to extend its lines from Colfax to Pullman, a distance of about 12 miles.

## SHOPS AND BUILDINGS

**Springfield (Vt.) Electric Railway.**—This company is building a new car house, with cement foundations. The contract for the erection of the building has been awarded to Crosby & Parker. The company's old car house and work shop, together with five cars, were destroyed by fire on Oct. 18, 1908.

## POWER HOUSES AND SUBSTATIONS

**Illinois Traction System, Champaign, Ill.**—A new substation to contain one 300-kw rotary and having accommodations for freight and passengers is being built by this company at Clinton, Ill.

**Springfield (Ill.) Consolidated Railway.**—This company is planning to enlarge its power station by the installation of a 1,500-kw. unit, the type of which has not been decided upon.

**Evansville (Ind.) Railways.**—This company expects to purchase a 500-kw. turbine, with exciter set, and will also install one rotary converter substation outfit.

**Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind.**—It is stated that this company has plans under consideration for enlarging its power station at Terre Haute. The company expects to install a 3000 kw. turbine together with four additional boilers, two large brick stacks and coal and ash handling apparatus for the entire plant.

**Hagerstown (Md.) Railway.**—This company expects to install a 150 or 200-kw. 550-volt belted generator. The company will consider the use of a good second-hand machine without a switchboard.

# Manufactures & Supplies

## ROLLING STOCK

Murphysboro Street Railway, Murphysboro, Ill., is in the market for two electric motor cars.

Philadelphia, Coatesville & Lancaster Passenger Railway, Parkersburg, Pa., will soon be in the market for new cars.

Southwestern Interurban Railway, Arkansas City, Ark., has ordered two interurban cars from the American Car Company, St. Louis.

Indianapolis Traction & Terminal Company, Indianapolis, Ind., has ordered 10 open and 44 closed cars from the Cincinnati Car Company.

Ottawa Electric Railway Company, Ottawa, Ont., has ordered 12 semi-convertible, single-truck cars, with 21-ft. bodies and pay-as-you-enter platforms.

British Columbia Electric Railway, Vancouver, B. C., is building 18 new cars which will have pay-as-you-enter platforms at its shops in Vancouver, B. C.

Gulf, Brownwood & Cisco Railway Company, Fort Worth, Tex., expects to install gasoline motor cars for the operation of the 20 miles of road outside of Brownwood which has been completed.

Third Avenue Railroad, New York City, has awarded the contract for air brakes for its 200 new pay-as-you-enter cars to the Allis-Chalmers Company. This concern will furnish both the compressors and the brakes.

Missouri & Kansas Interurban Railway, Kansas City, Mo., has been planning the purchase of two interurban cars. It is understood the order for these equipments will be placed through the Arnold Company, Chicago, Ill.

Halifax Electric Tramway Company, Halifax, N. S., has ordered from the Ottawa Car Company two semi-convertible, single-truck cars. These cars are similar to those already in service and have 21-ft. bodies, but will have pay-as-you-enter platforms.

Illinois Traction System, Peoria, Ill., has ordered 25 box cars of 80,000-lb. capacity from the American Car & Foundry Company, St. Louis, Mo. These equipments are to have long side bearings, which will allow the installation of Bosbury radial draw-bars.

Michigan United Railways, Lansing, Mich., has recently purchased six sets of trucks from the Baldwin Locomotive Company, 14 motor equipments from the General Electric Company and 200 high-backed seats from Hale & Kilburn Manufacturing Company, Philadelphia.

Atlantic City & Suburban Traction Company, Pleasantville, N. J., will be in the market soon for five new semi-convertible cars. These cars will be 40 ft. long and will probably be ordered from The J. G. Brill Company. The company also contemplates installing National movable advertising devices in 15 cars.

## TRADE NOTES

Franklin Railway Supply Company, Franklin, Pa., has moved its general offices to 30 Church Street, New York.

Avery P. Eckert has opened offices at 50 Church Street, New York, where he will conduct a general railway and electrical supply business.

Oliver Electric Company, Birmingham, Ala., announces that W. J. Cameron, Jr., formerly secretary and treasurer of the McClary-Jemison Machine Company, has become sales manager for the Oliver company.

Mrs. Francis A. W. McIntosh, who was formerly advertising manager of the Buffalo Forge Company, has opened an office at 103 Anderson Place, Buffalo, N. Y., where she will be prepared to furnish advertising copy of every sort.

MacArthur Brothers Company, New York, has just closed a contract with the Eastern Colorado Power Company for the construction of the Barker reservoir dam, near Boulder, Col. The dam is located across Middle Boulder Creek at a point about 17 miles west of Boulder.

R. W. Marshall & Company, New York, announces that Thomas Bibber has recently been engaged to represent this company in the New England States. Mr. Bibber, being a native of New England and having been engaged in the electrical supply business for the past 15 years, has a wide circle of acquaintances and friends not only in New England but in all parts of the country.

Albert Smithnight, secretary and treasurer of the Electric Railway Improvement Company, Cleveland, died Jan. 11. While Mr. Smithnight has not been in his usual health for some time, his death occurred suddenly after a short illness. He had been associated with the Electric Railway

Improvement Company since its organization and had made a large number of warm friends in the electric railway business.

Ohio Brass Company, Mansfield, Ohio, calls attention to a typographical error in its bulletin for January in an article entitled "The Interurban Coupler Problem." Referring to a statement made in the report of the Standardization Committee of the American Street & Interurban Railway Association the article said: "This statement seems to be the natural result of an investigation directed by an interested party. This should have read 'any interested party.'"

H. W. Johns-Manville Company, New York, has recently placed on the market a new product known as H-O pipe-joint cement. This cement is put up in powder form and can be kept in stock indefinitely, as it is claimed that it does not dry out or deteriorate. The cement is mixed with either water or linseed oil, making it ready for use. The chemical properties of H-O cement are such that it expands after the joint is made up, thereby making a tight joint.

Wagner Electric Manufacturing Company, St. Louis, Mo., has placed on the market a portable polyphase wattmeter which gives in a single indication the total power consumed in single-phase, two-phase or three-phase circuits. This instrument has the same accuracy on an unbalanced as on a balanced circuit. The Wagner line of switchboard and portable instruments also includes ammeters, voltmeters, power-factor indicators, frequency meters, wattmeters, ground detectors, and synchronism indicators, together with current and potential transformers for all capacities, voltages and frequencies and any character of service.

Independent Pneumatic Tool Company, Chicago, Ill., announces that at the annual meeting, held in Jersey City, the following directors were chosen: James B. Brady, W. O. Jacquette, John P. Hopkins, M. S. Rosenwald, James J. McCarthy, S. Florsheim, John M. Glenn, John D. Hurley, John R. Turner. At the annual meeting of the directors, held in Chicago, the following officers were elected: James B. Brady, president; W. O. Jacquette, first vice-president; John D. Hurley, second vice-president; A. B. Holmes, secretary and treasurer. The annual report shows that the company is in excellent financial condition, and that during the quarter ended Dec. 31, 1908, 40 per cent more business was transacted than during the corresponding period of 1907.

National Car Wheel Company, Pittsburg, Pa.—At the meeting of the board of directors of the National Car Wheel Company, held in Pittsburg Jan. 14, Edward H. Chapin, New York representative of the company, was elected a vice-president and director of the company. He will retain, however, his office of head of the New York office. The appointment comes as a well-deserved recognition of worth. Mr. Chapin has had a long experience in the manufacture and sale of car wheels, having been with the National Car Wheel Company since its organization in 1903 and previously for a long time with the Rochester Car Wheel Company. At the time of the consolidation, five years ago, he was secretary of the Rochester company and was located at Rochester, but after the consolidation was appointed sales agent of the company at New York City. Although a young man, he has been identified with the electric railway industry for some 20 years and is a faithful attendant of the different conventions, where he is deservedly popular. His many friends will congratulate him upon the result of the election last week and the promotion which is well deserved.

## ADVERTISING LITERATURE

Scully Steel & Iron Company, Chicago, Ill.—This company has issued a new price list which covers all of the various lines of material handled by the firm.

Dean Brothers' Steam Pump Works, Indianapolis, Ind.—This company has issued an illustrated leaflet describing the Dean vertical air pump and jet condenser.

MacGovern, Archer & Company, 118 Liberty Street, New York City.—This company has issued a list of electrical and steam apparatus and power-plant equipment which it has for sale.

Bausch & Lomb Optical Company, Rochester, N. Y.—This company has issued a new catalog of engineering instruments which contains complete specifications for the optical and mechanical construction of various types of transits, levels and theodolites. An entirely new form of mining transit is cataloged for the first time.

General Fire Extinguisher Company, Providence, R. I.—The latest number of the "Sprinkler Bulletin," which has just been issued by this company, discusses means to prevent fires in public buildings. The results of tests of Grinnell sprinklers are given, and also full details as to how apartment houses can be protected by automatic sprinklers.

## HISTORY OF THE TWIN CITY RAPID TRANSIT COMPANY

As announced last week, the Twin City Rapid Transit Company is publishing during the present month through the medium of full-page advertisements the history of the company from its beginning, 35 years ago, up to date. Last week the first six of the advertisements were abstracted. The seventh advertisement contrasts the early service between Minneapolis and Excelsior, which included from four to six trains a day, and only two during the winter, with the electric service of to-day, operating trains as frequently as a five-minute headway. The running time of the old steam dummy service was 80 minutes, as against 42 minutes on the electric trains. The reductions in the rates of fare since these early days are also mentioned.

After the Minneapolis Street Railway Company took over the line several attempts were made to find a substitute for steam as a motive power. Finally electricity was introduced. In 1889 the company was directed to install cable lines, but, as a preliminary, the city ordered the company to equip electrically one of the existing horse-car lines, and if this experiment should prove "a practical success," the city might order the Minneapolis Street Railway Company to operate electrically. The company also was bound to pledge itself to the sum of \$225,000, which, in the event of the failure on the part of the company to comply with the conditions of the resolution, should be forfeited to the city as follows: \$100,000 for each of two cable lines not built as provided in the resolution, and \$25,000 in case of default in construction and operation of the experimental electric line. Fourteen years of operation of horse-car lines had resulted in no dividends being paid to the stockholders, and therefore the financing of the cable construction was difficult. Nevertheless, the company was able to secure a number of leading business men as sureties, and the history gives their names.

In 1889 the company placed orders for cable engines and tracks, and also made a contract with the Thomson-Houston Electric Company for converting the Fourth Avenue horse-car line into an electric line. The bodies of the old horse-car trucks were placed upon heavy four-wheeled trucks built to receive the motors. A few experienced motormen were imported from the East to operate the first cars, and these experts educated the former horse-car drivers for motormen so the full complement of cars might be put in operation. The first car was put into regular service on Dec. 24, 1899. After the first few days' trial some of the smaller and older horse cars were used as trailers, thus practically doubling the capacity of the line. The historian asks:

In view of the "practical success" which this experimental line had demonstrated, who is there in Minneapolis today who would have purchased at a better price than scrap value the large amount of cable railway material which the Minneapolis Street Railway had on hand? It is a fact that this material was sold by the company for scrap.

The continued history of the Twin City lines includes a description of the reconstruction of all the track and the widening of the gage from 3 ft. 6 in. to standard. Attention is called to the heavy expense involved not only in the track work, but in the replacement of the then standard cars. By a resolution of the City Council, passed on Jan. 17, 1890, the Minneapolis Street Railway was directed to install electrical operation on its existing horse-car and motor lines. This resolution contained a clause stating that if electrical operation was found to be unsatisfactory the city might order cable lines substituted for electric lines.

Thus it is seen that the hazard of the undertaking to finance the railway was a most dangerous one.

The 11th full-page installment of the Twin City history describes the electrical equipment first purchased. The boiler and engine installation aggregated 3000 hp. Current was generated by 16 175-kw, 500-volt, bipolar Edison generators belt driven from a line shaft. With the work of electrification in 1890 T-rails weighing 70 lb. per yard were first laid. The transfer from horse to electrical operation was made substantially within the time required by the ordinance.

### ALBERT H. STANLEY IN AMERICA

Albert H. Stanley, general manager of the Underground Electric Railways Company, Ltd., London, England, is making a short visit in this country, the first since he resigned as general manager of the railway department of the Public Service Corporation of New Jersey two years ago to go to London. Mr. Stanley expects to go from New York to Detroit the latter part of this week, and will return to England Jan. 30.

In a recent interview with a representative of this paper, Mr. Stanley spoke enthusiastically of the development in traffic on the District Railway and tube lines controlled by the Underground Electric Railways Company, Ltd., and attributed this in large part to a better recognition of the transportation facilities now being afforded by these lines. The London public is as appreciative of rapid transit as that of any other community. This is shown by the fact that the steam railroads running out of London give probably the best suburban service in the world. Consequently the improvements in the way of equipment introduced in the District Railway and the construction of new underground railways have received prompt recognition. In fact, any increase or betterment in the service has met a quick response in increased traffic.

The underground railway routes in London are more complicated than in New York, where the subway between the Battery and Ninety-sixth Street is practically parallel to Broadway.

For this reason and because the entrances to the stations are not as conspicuous as in New York, being usually on private property instead of through kiosks in the street, the company has given a great deal of attention to advertising the routes and service given. It has, for instance, published a great many circulars, with maps of the underground lines, showing the stations and parts of the city reached by them. The entrance to each station is also marked by attractively illuminated signs 4 ft. x 6 ft. On the right of the entrance is a sign frame, surmounted by a tasteful scroll. Below the scroll are a silhouetted sky line of London in black and white and the word "Underground." The lower part of the sign contains the name of the station and the words, "Underground to anywhere; quickest way; cheapest way." In the middle of the sign is a map of the city plainly marked with all routes and stations of the company. On the left of the entrance to the station is a second tasteful frame of the same size, in which are set advertising posters, which are changed from time to time. Some of these posters are announcements of interest to the public. Others are pictorial. For preparing the latter the services of some of the leading illustrators in England have been secured. A recent poster of this kind represents two strangers consulting the map of the railway while a policeman stands

idly by. The poster bore the inscription, "No need to ask the policeman." Another poster showed a winter scene in London. The streets were covered with falling snow, but a section of the street showed that the passengers on the underground railway beneath the pavement were riding in well-heated and illuminated cars.

The company has also used illuminated signs extensively for different purposes in all of its stations and has found them especially useful to announce the destination of approaching trains at stations where there are services to different points. For this purpose a sign is arranged similar to that shown below:

1 2 3 — EARLS COURT	1 2 3 — EALING
1 2 3 — HARROW	1 2 3 — RICHMOND
1 2 3 — HOUNSLOW	1 2 3 — WIMBLEDON
1 2 3 — PUTNEY	1 2 3 — CIRCLE

In this sign the names of the terminal stations are always illuminated, but the numbers shown on the sign are visible only when the lamp, which is behind each number, is thrown into circuit. The destinations of the three next trains in the order of their arrival are shown in advance at the station by illuminating, for instance, the "1" in front of Ealing, the "2" in front of Wimbledon and the "3" in front of Putney. The lamps behind these three numbers are kept burning until the Ealing train passes out of the station. Then the "1" in front of Ealing is extinguished, the "2" in front of Wimbledon is changed to "1," the "3" in front of Putney is changed to "2," and the destination of the third train to arrive is properly indicated. In addition to these indicators, illuminated destination signs are carried on the front hood of the first motor car and elsewhere through the train. A large map of the system, enclosed in a frame, is also carried inside of each car at the center, attached to the monitor. The results have been very satisfactory.

In referring to the design of cars now used on the system with which he is connected, Mr. Stanley stated that all of the compartment cars with side doors had been taken off the lines of the company. All of the District Railway cars now have two end doors and one large side door. The tube cars operated by the Underground Electric Railways Company, Ltd., are supplied with end entrances only, as owing to the cylindrical shape of the car a side entrance is not practicable. The car-platform doors are opened and closed by hand by the passengers or station guards, and not by train guards as in New York. As an experiment, one train was equipped with pneumatic doors, which were operated by men on the train, but the plan did not prove popular. The present method saves time, as the passengers can unlatch the door before the train actually stops. The train crew, which usually consists of two men, not including the motorman, on trains of five cars or more in length, leave the train and step on the platform at each station. The signal for starting is given by the conductor when he is assured by the station or train guards that all doors are closed.

The zone system of fares is used on all the lines of the company. Each ticket when purchased indicates the farthest station on each line to which the passenger can ride for the fare paid. These tickets are punched before the passenger boards the train and are collected by the gateman at the station at which he gets off. In addition, a force of uniformed inspectors occasionally examines all tickets of all passengers in the stations or in the trains.

This is made necessary because season tickets are sold, and passengers may board a train without showing their tickets. Cases of fraud caused by persons attempting to ride without tickets are rare. The law is very stringent in cases of this kind. Offenders are subject to a fine of 40 shillings, their names are published in the papers, and the company has the right to post up the names and addresses at all stations. Collusion between trainmen and passengers to defraud the company is also rare, as all trainmen must be licensed by the London Police Department, a condition which insures a high standard of men.

The earnings of the company are increasing, and it has bills in Parliament authorizing extensions of some of its subsidiary lines.

### SEPARATING OIL IN CONDENSER DRIP

In the power station of the Metropolitan Elevated West Side Railway, Chicago, there has been built a home-made oil separator through which the leakage from the condensing equipment is passed and a considerable amount of oil thereby saved. The basement of this large power plant is floored with concrete and in the concrete are grooves by which the drips from the various pumps are led to a center drain. J. T. Lovett, chief engineer of the power station, noticed that the drip which flowed from the condensing engines and feed-water pumps carried on its surface a thin film of oil and with a view to saving this oil he designed the simple separator here described.

The separator consists of an old tank once used for carrying Pintsch gas when the elevated cars were first operated with steam locomotives. This tank is about 20 in. in diameter and holds 150 gal. It is installed below the level of the basement floor so that there is a head of about 3 ft. from the floor drain to the bottom of the tank. A tight pipe serves to carry the drainage from the floor pocket to the bottom of the tank. From the opposite end of the tank and connected with it at the bottom a large pipe leads up nearly to the level of the basement floor. In this way approximately a 3-ft. head is maintained at all times.

All the water mixed with oil which drains from about the condensing engines and feed-water pumps on the basement floor is led through this tank. The tank is so much larger than the connecting pipes that the progress of the flow is comparatively slow while the mixture is in the tank and therefore all the oil has ample time to separate from the water and rise to the surface. As the intake and the discharge from the tank are both close to the bottom all the oil in the water passing through the tank is trapped at the top. A gage glass serves to show the relative levels of the water and the oil, and provision is made for withdrawing the oil from the top of the tank through a pipe connection, with a stop cock under which a pail may be placed.

It is stated that this home-made oil-separating installation collects from 4 gal. to 5 gal. of oil each day. This oil is immediately put back into the engine oiling and cleaning system. It may safely be returned to this system because, from the very nature of the method of separation, the oil collected in the tank is thoroughly filtered and washed.

Robert Mather, president of the Rock Island Company, was elected chairman of the board of directors of the Westinghouse Electric & Manufacturing Company on Jan. 19. Charles A. Terry, secretary of the company, was elected vice-president.

**COMING MEETINGS OF A. S. & I. R. A. COMMITTEES**

A number of meetings of committees of the American Street & Interurban Railway Association and of its affiliated associations are scheduled for next week. All of them will be held at the headquarters of the association, 29 West Thirty-ninth Street, New York, at the day and hour given below.

On Jan. 27, at 10:30 a. m., there will be a meeting of the executive committee of the Transportation & Traffic Association.

On Jan. 28, at 10:30 a. m., meetings of the following committees are scheduled. The membership of these committees is given below:

Committee on subjects, of the American Association

	Thos. N. McCarter, Chairman,
Dana Stevens	R. N. Wallis
C. O. Kruger	Paul Winsor
W. A. House	C. B. Hardin
	C. Loomis Allen

Committee on revision of dues

	Arthur W. Brady, Chairman,
Howard F. Grant	Jas. F. Shaw
L. S. Storrs	B. V. Swenson

Committee on revision of membership dues

	Gen. George H. Harries, Chairman,
W. Caryl Ely	Paul Winsor
Thos. N. McCarter	H. R. Goshorn

Committee on Interstate Commerce Commission classification

	Gen. George H. Harries, Chairman,
Frank R. Ford	C. S. Sergeant
A. W. Brady	Hon. W. B. McKinley

Committee on municipal ownership and public relations

	Gen. W. A. Bancroft, Chairman,
W. Caryl Ely	E. C. Foster
H. J. McGowan	Russell Robb
J. C. Hutchins	Percy Warner
Horace C. Andrews	Chas. N. Black
	J. N. Roach

Committee on suggestions in President Goodrich's address

	Jas. F. Shaw, Chairman,
C. G. Goodrich	C. Loomis Allen
W. Caryl Ely	R. N. Wallis
A. W. Brady	A. E. Lang
	G. T. Rogers

On Jan. 29, at 10:30 a. m., there will be a meeting of the executive committee of the American Association.

A meeting of the executive committee of the Accountants' Association has been called for Jan. 30, at 10:30 a. m. There will be no meeting of the executive committee of the Engineering Association at this time, as the committee met in New York on Nov. 16. This meeting was reported in the *ELECTRIC RAILWAY JOURNAL* of Nov. 21, 1908.

President Shaw, of the American Association, announced this week the membership for the coming year of several standing committees of the American Association in addition to those mentioned above. They are as follows:

Committee on compensation for carrying mail

	Robert S. Goff, Chairman,
H. A. Nicholl	E. S. Fassett
G. B. Hippee	A. D. Schindler

Committee on education

	Prof. H. H. Norris, Chairman,
R. E. Danforth	Howard F. Grant
Prof. A. S. Richey	Prof. D. C. Jackson

These committees are not scheduled, however, to meet next week. The membership of the committees on insurance and on welfare of employees has not yet been announced.

**THE SUNDAY CAR QUESTION IN CANADA**

After a vigorous campaign by citizens' committees of London, St. Thomas and Port Stanley, Ontario, the voters of those towns declared for Sunday cars at the election held on Jan. 4. As the matter now stands the Ontario Legislature has the option of giving the city councils permission to pass enacting ordinances or to call for another popular vote. The companies affected in this matter are the South Western Traction Company, operating in all the places named, the London Street Railway and the St. Thomas (municipal) Street Railway.

The leaders in the Sunday car movement in London began their work a year ago with the organization of a committee of 100 citizens of all classes which undertook a thorough investigation of the Sunday car question throughout Canada. After a list of the Sunday car cities and towns had been secured the city clerks of such communities were asked to furnish a list of all important city officials besides a list of editors, judges, ministers and other prominent men. The following letter was then sent to such persons:

A citizens' committee has been formed here for the purpose of investigating the Sunday car question, with a view of installing Sunday cars in our city. We would like to hear from those towns and cities which have had some experience, and are writing to you as a representative citizen. Would you kindly let us know if any abuses have resulted from having Sunday cars in your city? Has church attendance decreased or increased? Is there any opposition at present to their running?

To this information would you kindly add your own opinion concerning the benefit and usefulness of Sunday cars as to your own city?

Your information will be gladly received by our committee.

Besides this letter a list of questions was sent to all the street railway companies covering all phases of Sunday traffic and Sunday labor. About 500 answers were received from over 70 places. The information received was tabulated as follows:

There are 54 electric railways in Canada, of which 37 run on Sunday. The following with a population of 1000 and over have Sunday cars:

Nova Scotia: Stellarton, Sydney, Halifax, North Sydney, Dominion City, Sydney Mines, New Glasgow, Trenton, Westville.

New Brunswick: St. John.

Quebec: Lachine, Hull, Aylmer, Sherbrooke, Lennoxville, Quebec City, Notre Dame de Grace, St. Laurent, Ahuntic, Point au Trembles and Montreal.

Ontario: Ottawa, Chatham, Berlin, Galt, Wallaceburg, Brantford, Windsor, Hamilton, Sandwich, Waterloo, Amherstburg, Oakville, Dundas, Walkerville, Burlington, Grimsby, Paris, St. Catherines, Merritton, Niagara Falls, Pt. Dalhousie, Welland, Sarnia, Point Edward, Toronto, Pt. Arthur, Ft. William, Essex, Thorold and Sault Ste. Marie.

Manitoba: Winnipeg.

British Columbia: Victoria, New Westminster, Vancouver.

Besides this list there are over 35 smaller places that have Sunday cars.

The first Sunday street car system in Canada was started in Montreal in 1861 and the most recent is that of Fort William, July, 1908. There are six larger places than London and over 45 places smaller than London, above 1000 population, that have Sunday car service. Edmonton, Alberta, expects to have Sunday cars next summer. St. Thomas has voted favorably on the question. Two other towns in Ontario will have Sunday cars operated during next summer.

## SUNDAY TRAFFIC AND CHURCH ATTENDANCE

In Victoria, B. C., the traffic on Sunday in winter is 25 per cent less than on week days; in summer it is about the same; in Ottawa it is much less; in Port Arthur, about one-third, and in Halifax, about two-thirds. In Windsor, Chatham, Montreal and Hamilton it is about the same while the cars are running. Sunday traffic differs in many ways from that on week days. The early morning traffic is light. From 10:30 a.m. to 1 p.m. it is from fair to heavy. Then follows an hour of light travel. The afternoon traffic varies according to the season; in July and August it is very fair. In the evening the amount of traffic depends upon the size of the city and the kind of weather.

Regarding church attendance being influenced by Sunday cars, 212 replies declared church attendance had increased, 78 said that there was no difference, 22 said they could not tell and 5 letters from ministers declared that the attendance at their churches had decreased. In general the church attendance is increased, because it is easier to attend in bad weather. It was found that some downtown churches in large cities would have had to close but for the Sunday cars and that certain missionary features in these central churches were made possible only by the Sunday car service as otherwise workers from the residential districts could not reach them.

## SUNDAY LABOR

The conditions under which Sunday labor is carried on were given particular attention. No employees, except the manager and superintendent, are required to work in any town or city seven days a week. Since labor on Sunday is required to run cars and the law forbids compulsory seven days' labor, mutually satisfactory arrangements were made in all these places. By a system of shifts, all employees have half a day on Sunday to attend divine service. Spare men and relief men work on Sunday and are glad to get the employment. The committee did not come across one place in Canada where men are compelled to work seven days a week.

## THE GOOD OR EVIL RESULTS

Replying to the question: "Have any abuses resulted?" only one letter from any city or town official had any other answer than an emphatic "No." Some ministers regarded going to the parks on Sunday afternoons as an evil, but the large majority of the clergy regarded such an outing as beneficial, particularly for those who are denied the privilege during the week.

The committee obtained considerable information about the different campaigns for Sunday cars waged in each city. In each contest there were many prophecies of such results as Sunday theaters, dancing pavilions, baseball, circuses, beer gardens and a wide-open Sunday generally. The committee found that Hamilton has had Sunday cars for over 20 years; Toronto, 11 years; Windsor, 24 years, and Victoria, B. C., 18 years, and that not one of these things exists in any way in any one of these cities.

## NECESSITY FOR SUNDAY CARS IN LONDON

Taking up the question of Sunday cars in London, hundreds of people interviewed on this subject mentioned the inconvenience and distress that are undergone on the day of the week when nearly all transportation is cut off. London is a city practically  $3\frac{1}{2}$  miles square containing 50,000 people and extending rapidly. It contains 16 religious denominations, but only 4 have churches in all parts of the city. All those who are attached to the remaining 12

denominations must walk from all parts of the city or attend the nearest church. In addition there is a long list of people who, because of their calling, must do considerable traveling on Sunday and in all sorts of weather. A partial list comprises doctors, nurses, employees of electric light and city gas companies, commercial travelers, police, telephone girls, post office officials, druggists, dentists, janitors, city firemen, railroad employees and mission workers. In fact, there is scarcely a family in London not affected in some way throughout the year by the closing of street car service on Sunday. London is the only North American city of over 25,000 population which has no Sunday cars.

At the present time the privilege of riding on Sunday is confined to the well-to-do. With a Sunday car service all the advantages of travel will be open to each citizen. There are more men employed in London to-day as coachmen, chauffeurs or in livery stables than it would take to run the entire street car system.

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**RECOMMENDATIONS OF GOVERNORS TO THE  
LEGISLATURES**


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In the issue of the ELECTRIC RAILWAY JOURNAL of Jan. 16, 1909, extracts were presented from the messages of the Governors of a number of States relating to legislation affecting railroad interests and recommendations regarding the control of public utilities. The abstracts which are appended supplement those published last week. In addition references to these same subjects are reprinted from the inaugural addresses of Governor Marshall, of Indiana; Governor Carroll, of Iowa, and Governor Prouty, of Vermont:

## GOVERNOR GARST, OF IOWA

The State Railroad Commission has authority only within the State and over railroads and express lines, but there has been such changes in the business world and so great a development of conflicting interests that a reasonable expansion of its powers seems to be necessary. The commission should have authority over the telegraph and telephone lines as much as over common carriers. The commission should also have some measure of authority over the public utilities of the State, such as street-car lines, water works, gas and electric plants; but care must be exercised so that there is left with the municipalities sufficient power for the proper police regulation of these private enterprises. Matters purely local must be left to the local communities.

I recommend that you provide by appointment for an attorney on behalf of the State to have charge of all controverted questions before the Railroad Commission in which the rights of the people are in any way involved, and who shall also appear before the executive council in all matters involving any of the activities which are under the Railroad Commission. He should be required to devote his entire time to the study of those questions that are likely to come before either of these bodies for adjustment or adjudication, and should have at his disposal facilities for making thorough investigation and preparation of all cases. He should be appointed by the State Executive Council, subject to removal at will by that body, should give his entire time to the work and receive a salary of not less than \$3,000.

It may be thought that in entering upon the field of interstate commerce we are going beyond our duty as a State, but when it is understood that a very large proportion of the transportation business of Iowa is interstate in character, it is imperative that we make ample provision for protecting ourselves.

## GOVERNOR FOLK, OF MISSOURI

Experience teaches that it is not prudent to trust the gen-



erosity of the owner of a monopoly, and every public-service corporation has a monopoly. There is no necessity for regulating the charges of individuals or corporations that engage in ordinary lines of business open to competition. The law of competition fixes their charges upon a reasonable basis.

Believing that the cities and towns should have that control, the passage of an act was recommended giving full power to municipalities to regulate the rates of street-car companies, lighting companies and all public utilities operating in such municipalities.

This law was enacted at the extra session of the General Assembly in 1907. Under it each city and town in the State was given absolute power to regulate the rates of public utilities, and is thereby enabled to protect its citizens against injustice. The matter of rates charged the people of a city by street-car lines, lighting companies and utilities of that character is one that concerns the people of that city alone and does not affect the people of the entire State. It is, therefore, a problem which I think the people of each city should settle for themselves. If they do not gain relief when they have the power in their own hands to get relief, they have only themselves to blame.

#### GOVERNOR STUBBS, OF KANSAS

I most earnestly recommend the enactment of a public utilities law in Kansas, using whatever may be used to advantage of the present railroad law as a basis and adding the best features of the New York and Wisconsin public utilities laws, which have had a severe practical test.

This law should empower a commission to supervise not only the railroads, but all public utilities, including water, gas, electric light, heat, power, express, car, pipe-line, telegraph and telephone companies, and all other public-service utilities; also have jurisdiction over the issue of stocks, bonds and securities of railway and all other public utilities corporations; also the power of determining whether public necessity and convenience demand the building of additional lines of railway, or additional water, gas and electric light plants in communities where there is in operation a plant of similar character, under an indeterminate franchise; also the power to ascertain the physical value of all public utilities property within the borders of the State.

It should be charged with the duty of prescribing proper and uniform accounting methods and of requiring from all companies under its jurisdiction reports containing operating and financial and other data, including schedules of rates charged for the service rendered.

It should be charged with the enforcement of the law relating to hours of employment for railway employees; with power over railway terminals; power to require railroads to install telephone lines; to compel railroads to furnish connections with spurs running to industries; power to determine the value of public utilities, including street railways, and in condemnation proceedings by municipalities under the public utilities law; to enforce statutory regulation of wires and other overhead obstructions crossing railroad tracks.

It should also have the power to secure all information pertaining to the cost of construction, maintenance, operation and transportation of supplies or service of any kind that is furnished to the public.

This commission should consist of five members, to be appointed by the governor and be subject to removal by him for cause. This law should also provide for the three railroad commissioners to be a part of this commission during the ensuing two years.

The present corporation law seems to provide that when a corporation abuses its power a receiver shall be appointed for the purpose of winding up its affairs and disposing of the corporate property. This is often too drastic. The law should be amended so as to provide for receivers to correct corporate abuses, and when corrected to hand back the corporate property, without dissolving the corporation, into the hands of its owners and managers, subject to the supervision of the court. This amendment should be supplementary to the present law, so that either judgment may be pronounced at the discretion of the court.

#### GOVERNOR DAWSON, OF WEST VIRGINIA

The advisability of creating a public service commis-

sion is another subject discussed at some length in my 1907 message. Formerly our attention was given largely to regulation of railroads only, but there are other public-service corporations whose operations should be regulated by law. Nearly every public-service corporation is a monopoly, either by its nature or by circumstances. Every railroad in the State is a monopoly. There is no competition among them, and in the nature of the case cannot be to most of the people living upon their lines, because these people have no other railroad. The telegraph companies, express companies, the telephone lines and the companies which furnish water and natural gas and other means of lighting and heating in our cities and towns are practically monopolies, because there is no competition. If competition arises it is got rid of by buying out the opposing concern or by consolidating or by agreement upon prices. But there are other things that need regulation besides prices, and this is especially true as to railroads. I will not take time to mention them; the subject has been so much discussed that it is certainly not necessary. Efforts to get competition usually result in the last condition being worse than the first. For example, take the telephone and the capital city of the State as a specific instance. At first there was one telephone company doing business in Charleston. The people thought its rates too high or its service inadequate or both, and to get competition and correction another telephone company was granted the privilege. Now a citizen of the city is practically compelled to have two telephones in his place of business or his residence, and therefore pay the rental of two, and pay for each of the two what he had to pay for one, and get only the service that one ought to have given him for the money. The effort to get competition therefore has resulted in paying double the price that ought to be paid.

We are told, however, that this State is just on the eve of development, that we should not have stringent laws, but that we should treat capital tenderly and wait until we reach a maturer period in our development. The right to regulate these quasi-public corporations and companies is undoubted, both from a legal and a moral point of view; and the duty of the Legislature to protect the public is one of the highest put upon a representative body, and the duty is urgently imperative. Municipalities should not grant franchises without public approval.

#### GOVERNOR MARSHALL, OF INDIANA, IN INAUGURAL ADDRESS

The General Assembly of this State in 1905 enacted what is commonly called "A Railroad Commission Law." In 1907 it either passed or pretended to pass an act amending certain sections thereof. The preamble as found on page 454 of the acts of 1907 is vague, uncertain and does not disclose what act was attempted to be amended. Whether the present commission is de jure and whether its orders are legal are mooted questions. To prevent useless litigation I recommend the repeal of the acts upon the subject and the passage of a new one, providing that no more than two of the commissioners shall be of the same political party, that one shall be an attorney having knowledge of and experience in railroad and transportation law, and another shall have knowledge of the mechanical part of railroading.

While upon this subject it is not inappropriate to say that great loss of life occurs from public trespassing on railroad property. Additional legislation should make it an offense to enter upon such property for any purpose other than to transact business with such company, giving employees police power to arrest such trespassers, but taking care not to relieve the company from damages in the event of false arrest or brutal treatment.

A railroad hereafter ought not to be permitted to cross another railroad at grade without express permission of the commission.

The hour has gone by when it is necessary to beg investors to accept franchises. Hereafter municipalities should be prohibited from granting franchises until the price the public is to pay to enjoy them is clearly defined, and the municipality is permitted to share in the profits arising therefrom. When those things have been provided for no second franchise should be granted until the first has been annulled for fraud or failure honestly and efficiently to serve the public.

## GOVERNOR CARROLL, OF IOWA, IN INAUGURAL ADDRESS

The question of the establishment of a commission to regulate and control the public utilities of the State has been discussed to a greater or less extent by some of our people and is, in my judgment, a subject worthy of your careful consideration. Such a system has been adopted in several of the older and in some of the newer States. Just how to harmonize our present statutes to such a system I am not prepared to say. In the various States the power of the commission differs. The scope of the power in some States at least embraces railways, street railways, telephone lines, electric light plants, gas and water plants and possibly other interests. The commission is given authority to regulate the issue of stocks and bonds, the making of rates, the methods of accounting, has power to inspect, etc. The authority granted to the commission in other States is, in this State, lodged with various officials, viz.: The executive council of the State, the railway commission, the city councils and the people of cities by the granting of franchises. It would perhaps be more satisfactory if the exercise of these various powers were lodged with a single board or commission to be known as a "Public Utilities Commission." This might be done by the creation of an entirely new commission, by enlarging the powers of the railway commission or by converting the railway commission into a public utilities commission.

The fact that ours is a comparatively young State and has few large cities may lead to the conclusion that the same necessity for legislation along the lines above suggested does not exist as in older States, but it should be remembered that we legislate for the future as well as for the present.

This whole subject is one far reaching in its effect and of great importance to all of our people. In my judgment its consideration cannot and should not be long deferred. I believe that it is entitled now to your consideration.

## GOVERNOR PROUTY, OF VERMONT, IN INAUGURAL ADDRESS

The law passed during the last session of the Legislature providing for the regulation of railroads and the abolishing of grade crossings has met with such universal favor and has proved of such great benefit that a demand has sprung up that all public service corporations should have similar State supervision.

The work of our railroad commission has shown what may be done by wise supervision, backed by proper authority for the enforcement of such regulations as it thinks proper to make. We have seen many of our dangerous grade crossings abolished and a general improvement in the service rendered the public, not only as regards safety, but also convenience. This is as it should be.

When any corporation receives a charter from this State or comes here to do business, such a corporation becomes a child of the State and the only supervision which can be exercised over that body being through the State, the State is under moral obligations to see that it carries on its business in a proper manner, subject to the rights of the people. The number of public-service corporations doing business in our State is increasing rapidly, and it is the part of wisdom at this time to place them under such control as shall retain for the people their full rights.

I have spoken particularly of the telephone and telegraph corporations because they are perhaps more prominently before the public than any others at this time, but the same arguments apply to other public-service corporations and should be applied to them. For the purpose, therefore, of providing such supervision, I recommend that the name of the railroad commission be changed to that of Public Service Commission, and that it be given supervision over all public-service corporations with such power and authority as are now given this commission for the supervision and control of railroads. This will, of course, increase the work of the commissioners very materially and their salaries should be increased in proportion. They should also be given such clerical assistance as is necessary for the proper carrying on of this work.

Finland, it is reported, is to be connected to St. Petersburg, Russia, by an electric railway.

## COMMUNICATIONS

## BOW COLLECTOR VS. PANTOGRAPH

MURALT &amp; Co.

NEW YORK, Jan. 14, 1909.

To the Editors:

I notice your editorial of Dec. 19 on bow collectors and the letters of Messrs. Varney and Murray in your issue of Jan. 9 on the same subject.

Mr. Varney contends that European designs were tried on the New Haven and failed. Mr. Murray takes issue with Mr. Varney and states that the spring-supported auxiliary contactor, modeled on European practice, did not fail, but, on the contrary, gave better results. Unfortunately, Mr. Murray did not have time to go thoroughly into this question on account of other more important matters which diverted his attention.

Please let me correct a misapprehension under which both Varney and Murray are laboring. Service conditions in Europe and America are not essentially different as far as current collection is concerned.

As pointed out by Mr. Murray, the governing features are: (1) train speed, (2) variation in height of trolley wire, and (3) amount of current collected.

Speeds attained in Europe in regular, everyday service are directly comparable with those in use on the New Haven. During the well-known Zossen tests bow collectors proved to be successful even at speeds of 125 m.p.h. Variations in height as encountered in Europe are not unlike those of the New Haven. I recall offhand at least one road, with which I was somewhat connected 8 or 10 years ago, which has variations from 4.8 m (15.7 ft.) to 6.5 m (21.3 ft.), or almost exactly what Mr. Varney gives for the New Haven.

With reference to currents collected, the European roads do a great deal more than the New Haven. Not only are the trains handled by one locomotive heavier than those of the New Haven, but it will be remembered that the line pressure generally used in Europe is only about one-third of that employed by the New Haven, so that the amperage on the New Haven is certainly considerably smaller than is common in Europe.

On the whole, the New Haven conditions are in no way dissimilar to European conditions as far as collection of current is concerned. You were, therefore, undoubtedly correct in suggesting in your editorial that European practice might have been followed to good advantage. Indeed, this refers not only to the current collecting devices, but to almost every one of the items which have given trouble on the New Haven. As a matter of fact, Mr. Murray's experiments and the various changes recently made in the New Haven equipment clearly corroborate this view.

Mr. Varney's statement that the New Haven type of pantograph has been selected by several European roads calls for further explanation. To the best of my knowledge no continental maker has yet used a plain pantograph device, nor do I know of any one contemplating such use.

Mr. Varney himself indicates that it is necessary to distinguish between a pantograph subframe, as illustrated on page 61 of your issue of Jan. 9, and a regular pantograph collector, as used by the Westinghouse Company.

To me the essential differences between bow and pantograph collectors appear to be as follows:

The bow collector moves about a relatively fixed center, and the shoe or collecting surface swings in a circle. The

movable part is light in weight, always in a trailing position, and it closely hugs the wire, accommodating itself without difficulty to all the inequalities and variations of the overhead construction.

The pantograph collector is a much heavier mechanical structure, and it has a plain vertical movement. The shocks resulting when such a device passes over low spots at high speeds are perfectly obvious.

Perhaps the best solution of collector difficulties will in the end be found in the roller bow, which combines the broad surface of the bow with the rolling contact of the trolley wheel.

I, too, can sympathize with Mr. Varney's feelings. But I do not see that he has in any way made out a case against you, and the onus is still upon him of proving that European developments were properly considered in the unfortunate New Haven experiment.

C. L. DE MURALT.

BOSTON, Jan. 16, 1909.

To the Editors:

I was very much interested in the letters by Messrs. Varney and Murray as well as in Mr. Kenyon's article, published in your issue of Jan. 9. Mr. Kenyon hits the nail squarely on the head when he charges to needless inertia and a low natural period of vibration in the collecting devices most of the troubles to which they are heir. A flexible suspension of the overhead construction is only a half-way step toward reducing trolley wire trouble. It is equally important to secure flexibility in the collecting device. It is true that to a certain extent the designers of the New Haven contact system were between the devil and the deep sea, but it seems they chose the former when they might have found a lifeboat upon the latter.

The trouble in the present system is not, of course, chargeable to the pantograph support which may have use in overcoming great differences of level, so much as to the mounting of the actual contact-making device in an unnecessarily massive way. The pantograph had previously been used chiefly for mining locomotives in which the changes of contact level are great, but where the speed is low and the inertia of the collector relatively small. It is certainly a device which does not appeal to one's sense of mechanical propriety when applied to high speed. There is, too, in the up-and-down motion of the pantograph an opportunity for grinding and chattering on the wire at its points of support that might to advantage be avoided.

It may take considerable experimenting to adapt any sort of collecting device to the extreme variations in the height of the trolley wire found on the New Haven road and a Chinese copy of foreign devices might give trouble. But the foreign engineers have been working upon the right principle in keeping down the inertia of the contact parts instead of trying to get flexibility in a device intrinsically disqualified as regards flexibility by its structure.

ENGINEER.

The traffic on the different lines controlled by the Underground Electric Railways Company, Ltd., London, Eng., continues to improve. During the last half of 1908 the receipts from operation of the District Railway showed an increase of £39,000 as compared with the same period during 1907. The increases on the tube lines during the same time compared with the corresponding period of a year ago were: Baker & Waterloo, £14,000; Piccadilly & Brompton Circus, £22,000; Hampstead, £19,000.

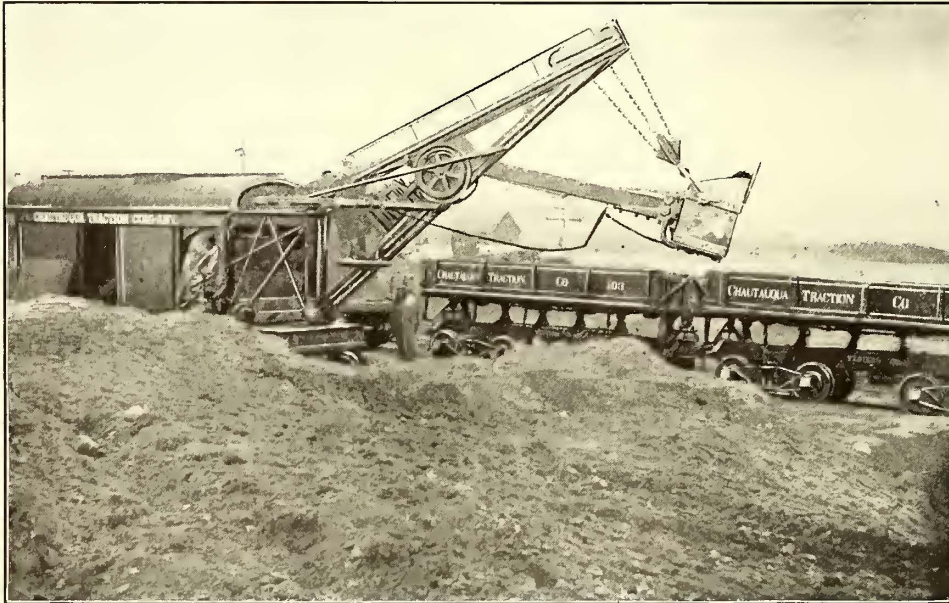
## TRAINING SCHOOL FOR ELECTRIC RAILWAY EMPLOYEES

As a result of its success in training young men in the rudiments of steam railroad work, the National Railway Training Association, Kansas City, Mo., has enlarged its field, and is now giving a correspondence course in the duties of electric railway employees. The company's plan is to advertise extensively in such papers and periodicals as reach the homes of young men whom it is desired to interest in the possibilities of electric railway work. This advertising campaign has resulted in the association receiving many inquiries from men in all parts of the country. As far as it is possible to do so by correspondence, a selection is made from among these men of those who have the necessary requirements as to intelligence, education, morality, honesty, etc. The association also insists that the men who take up its course of training shall meet the proper physical requirements as to age, size, hearing and sight, and in addition, requires references from at least three responsible people. If a man qualifies in these requirements, a small fee is charged for enrollment and instruction, and the association agrees to use its best efforts in securing employment for students as near their homes as possible. The course of instruction is carried on along much the same lines as are employed by other well-known correspondence schools. The instruction sheets are fully illustrated with diagrams and engravings which are helpful to the student, and care is taken to avoid as much as possible anything which might confuse or prove to be too technical for the layman. The course does not claim to fit students to take charge of a car immediately. The object is to place within the reach of electric railways candidates for employment who have had a good elementary training in the fundamentals of their work. From these men it is possible to build up a force of efficient operatives within a short time and at a very small expense. When the student is taken for trial by the railway company, and is given a few days with an instructor on a car to familiarize him with the actual operation of it, he quickly grasps every point, because he has made a study of the fundamentals which candidates without any previous training take a long time to acquire. Two courses of instruction are given, one for motormen and one for conductors. Both courses are very complete, and include the study of the ordinary rules, an elementary exposition of the arrangement and use of the various parts of electrical apparatus on street cars, what to do in emergencies, how to handle accidents, the responsibility of motormen and conductors, methods of fare collection and many other points.

The National Railway Training Association has only been giving this course of instruction in electric railway work for a few months, but it has already received requests from five street railway companies in different parts of the country to have all men enrolled in the course near their cities sent to them for trial when they have completed their course. In one large city students of the association are given preference over all other applicants. The association receives its income solely from the small fee paid by students for the course of instruction. It charges neither railway companies nor its students any fee for furnishing men or obtaining employment. The railway companies which have approved the methods of the association by their request to have students sent to them are under no obligation on their part to employ any man who does not prove satisfactory on personal examination or to retain a man if he proves unsatisfactory later on.

**COST RECORD OF AN ELECTRIC POWER SHOVEL**

Some accurate records of the cost of operating an electric power shovel used in digging ballast have been furnished this paper by the Chatauqua Traction Company, Jamestown, N. Y. The shovel, which was built by the Vulcan Steam Shovel Company, Toledo, Ohio, weighs complete about 40 tons and the car body on which it is mounted is 27 ft. long. The dipper has a capacity of 1½ cu. yd. The various movements of the shovel are made with three d.c. 600-volt motors, one of 75 hp for hoisting, one of 30 hp for swinging the boom and one of 30 hp for crowding the shovel. These motors are protected from overloading by series overload relays, automatic controllers and circuit-breakers. In addition the swinging motor is fitted with a solenoid brake for overcoming the momentum of the boom and the crowding motor is equipped with a foot brake operated by the craneman.



**Vulcan Electric Power Shovel Digging Ballast**

The record of one of these shovels used by the Chatauqua Traction Company is given in the following quotation from a letter written by A. N. Broadhead, president:

A short time ago we placed an ammeter and voltmeter on the shovel for the purpose of ascertaining cost of operation per hour. Of course, the shovel did not work constantly during this time, owing to the shortage of cars—if we had been able to keep the shovel at work without a let-up, we feel sure the cost per hour would be materially reduced. The cost of power and help was as follows:

Yardage per hour.....	66 2/3
1 man .....	\$0.33
1 man .....	0.25
2 men, at 15c.....	0.30
20.346 kw-hours at \$0.0088.....	0.18
Oil and waste, estimated.....	0.04

Total cost per hour.....	\$1.10
8 hours at \$1.10.....	\$8.80
8 hours at 66 2/3 cu. yd.....	534 cu. yd.
\$8.80 divided by 534 cu. yd.....	0.0164 cent

The material in which the shovel was worked was a mixture of gravel, sticky clay and sand, which made it hard to dig, but as will be seen from the above figures, the cost was very low. There are, of course, several causes for this, the principal ones being, first, that as the shovel required no boiler, the cost of a fireman and of hauling coal and water was eliminated; second, that the work of the

shovel was intermittent and when the shovel was idle no power was being consumed, as would be the case with a steam shovel where steam must be kept up constantly. The shovel could have been operated to its maximum capacity, which would have given twice the yardage at nearly the same cost, as the men had to be paid whether they were working or idle, and the additional cost for power would not have been more than twice what it was, which on the same basis would mean 1068 yd. at a cost of \$10.24, or \$0.00958 per cubic yard.

**CONSOLIDATION OF AMERICAN BLOWER COMPANY AND THE SIROCCO ENGINEERING COMPANY**

The American Blower Company, of Detroit, Mich., and the Sirocco Engineering Company, of New York, have been consolidated under the name of the former company with main offices at Detroit. The factory of the former Sirocco Company at Troy, N. Y., will continue in operation, together with the main works at Detroit. The personnel of the new company will be as follows: President, James Inglis, who has been the head of the American Blower Company; vice-president, William C. Redfield, former president of the Sirocco Engineering Company; treasurer, Charles H. Gifford, general manager of the B. F. Sturtevant Company up to a year ago, and secretary, Mr. Still, formerly chief engineer of the American Blower Company. S. C. Davidson, inventor of the original "Sirocco" apparatus, and now with the parent "Sirocco" works, Belfast, Ireland, is financially interested in this important merger.

The magnitude of this move is only in keeping with the rapid growth of the American Blower Company, which is one of Detroit's greatest industries, and shows that the company was thoroughly convinced of the merit of the "Sirocco" designs. In anticipation of a general improvement in business, the necessity for increased foundry facilities and the consummation of the "A B C"—"Sirocco" consolidation, the American Blower Company purchased outright during 1908 the complete foundry and plant formerly operated by the Northwestern Foundry & Supply Company, Detroit. The large triangular-shaped property owned and occupied by the American Blower Company since about 1881 has been entirely covered with buildings by the completion in 1907 and 1908 of a large steel plate fan shop and office addition. The company recently purchased a large tract of land across the street, upon which it is expected to erect within a comparatively short time new buildings, covering an area of approximately 175 ft. x 300 ft.

The Edinburgh (Scotland) Tramway Company will give its employees who have served 10 years a stripe, which carries with it increased pay. Merit medals are also to be introduced in recognition of any special meritorious act on the part of an employee.

# News of Electric Railways

## Fares for Cleveland Lines Under Consideration

Mayor Tom L. Johnson's absence from Cleveland has delayed the consideration of an increase in the street railway fare at Cleveland, and unless action is taken by F. A. Scott and Warren Bicknell, the receivers, a conclusion will not be reached immediately, as the Mayor and the City Council desire to have the matter taken up at public meetings. Few of the Councilmen have committed themselves on the request of the receivers for a short-term grant at the rate of six tickets for 25 cents or a cash fare of 5 cents. In anticipation of unfavorable action on the part of the city administration, the receivers have arranged to operate under the original franchises. If the contention of the Cleveland Railway that the franchises on Woodland Avenue and for the West Side lines do not expire until 1910 is sustained, the work of the receivers will be greatly simplified. If, however, it is decided that the franchises have expired and that the lines must be operated at a 3-cent fare in accordance with the franchise over these routes granted to the Municipal Traction Company, the receivers will not be obliged to give transfers to any other lines, because these lines are not earning 6 per cent on the capitalization, the condition on which free transfers would be given.

The lines on which the receivers have a right to make a fare of 5 cents or 11 tickets for 50 cents are as follows: St. Clair, Superior, Payne, Wade Park, Euclid, Cedar, Scoville, Broadway, Union, East Fifty-fifth, East 105th, Fairfield, West Fourteenth, Scranton Road, Clark Avenue, West Twenty-fifth and Burton. The undisputed 3-cent lines are Denison, Fulton, Central and Quincy. The lines on which the Cleveland Railway Company claims franchises until 1910, but which the city authorities claim have expired, are the following: Woodland, Kinsman, Lorain, Bridge, West Madison and Detroit to the city limits. The Clifton Boulevard line to Edgewater Park expires with the Detroit line, but from there to the western city limits it runs on a private right of way.

Robert W. Tayler, District Judge of the Circuit and District Courts of the United States for the Northern District of Ohio, addressed two letters to the receivers of the Municipal Traction Company on Jan. 11, on the subject of fares. Abstracts of these letters follow.

In the first letter Judge Tayler said:

"The early expiration of some ordinances and the comparatively short life of the longest of the 5-cent ordinances make it absolutely necessary for you to earn more money from operation than if there was a long-time franchise.

"The public burden thus imposed during the life of these short-time franchises can only be avoided, and can now and for all time be avoided, by the immediate passage of an ordinance, which, while allowing a rate of fare which will permit the raising of money for improvements and extensions in accordance with sound business principles, will, by its fixed and certain provisions, make a sure and effective contract between the city and the owners of the property that no more shall be charged than the service actually costs. In other words, an ordinance embracing all of the commendable features of the so-called security grant, but containing in addition the vital and distinguishing features and made so by valid contract:

"(1)—The limitation of fare to the actual cost of service, including in this, of course, 6 per cent and no more on the stock and values which have not passed into stock, and interest on the bonds; and,

"(2)—A system of accounting and inspection, in which the city has the right so far to participate as to make certain that only this cost of service is charged.

"Speaking as a citizen of Cleveland, such an ordinance ought now to be passed. If it should be passed, every creditor of either the Municipal Traction Company or the Cleveland Railway can, I am sure, have his claim satisfactorily adjusted immediately after the ordinance becomes effective; steps can at once be taken to provide for new equipment, and the community will be absolutely assured that it will never be required to pay more for street car service than it costs; there will be no speculating in the franchises; there will be no ground for suspecting anyone of corruption, and every incentive will be present to provide the highest kind of street car service, and what the people really want and are entitled to have will at last be accomplished.

"With such an ordinance, what the maximum rate of fare may be is only important in so far as it must be high enough to invite the investment of new money in extensions and improvements, many of which are needed in this commu-

nity, and none of which can be made until after the passage of a permanent ordinance.

"The passage of such an ordinance now would not, in any way, affect or prejudice the rights or claims of the Municipal Traction Company or the Cleveland Railway, as between themselves, whether those rights or claims relate to the lease or to the property of the Forest City Railway. In other words, it would not at all affect the issues to be tried out in the pending litigation.

"Finally, it would put Cleveland in the position, after these years of struggle, of having solved the street railway problem on righteous lines."

Judge Tayler said in the second letter:

"The several things which you have to consider are as follows:

"First—That the property in your hands must be suitably protected and preserved. It ought not to be permitted to deteriorate in value to the slightest extent except as use, with a perfect care and maintenance, will necessarily cause deterioration.

"Second—The operation of the lines under your care is the performance of a public service and a public duty. A street railroad operated in any other way would be intolerable. To the extent, therefore, of the equipment, power and funds at your disposal good service must be given.

"Third—The creditors of the companies interested in the property must be protected. Those whose debts are due ought to be paid at the earliest possible moment. The propriety of their prompt payment depends not at all upon the question as to whether the property has been operated at too low a rate of fare, but upon the fact that the debts are due and arose out of the operation of the property.

"Fourth—The owners of the road, the lessor and the lessee as well, are entitled to have their property rights, whatever they may be, protected and preserved at all events, subject, of course, to their contract obligations to the public and to their creditors. There is one part of the property which the receivers are daily consuming which they cannot restore or replace, and that is the franchise right to operate the lines at all in this community. This is not a right to be trafficked in, but it does furnish the only basis on which they can receive any returns on their investment.

"Fifth—The contract rights of the Cleveland Railway Company permit it to charge 5 cents for one fare or 50 cents for 11 tickets on some lines, with certain transfer privileges, and 3 cents on the other lines with transfer rights depending upon certain conditions which, presumably, do not now exist. In view of the speedy termination of some of the franchises carrying the higher rates of fare and of the relatively early termination of other like franchises, it is quite apparent that unless some definite arrangements can be at once made with the City Council for a satisfactory and uniform rate of fare you must resort to the rights provided for in the franchises which were in effect last April before the passage of the ordinance which was defeated in October.

"Sixth—I approve the policy you have outlined that in ministering to a community like Cleveland it is impossible and undesirable to find an equality of profit in operating all lines, and that some portions of some lines can only be operated for the time being at a loss; it seems to me that every properly regulated and developed street railroad system must keep ahead of the community population, not behind it; it must encourage on its own account and for the public benefit the expansion, not the contraction, of the occupied area of homes; street railroad service is primarily allowed, not for the private profit, but for public convenience; and the kind of street railway service, the cost of which the public is willing to pay for, is the kind which I have outlined in this paragraph.

"Although the public convenience is the fundamental justification for the permission to use the streets for tracks and cars, the investment in these, whether made by the public as such or by private individuals, must, in common honesty, be protected, but the time is past, at least in this community, when more than that protection can be afforded. This permission means no more and no less than a fair return on the capital invested, with some assurance of the return of the principal sum when the time arrives for such return, either by a new franchise or by the purchase of the property at a fair price by the successors to the franchise or by the creation of a sinking fund which will safely protect such a precarious property as tracks and equipment in the streets of a city with no right to operate

them. The latter is a contingency always to be avoided, if possible; for, in the long run, the public must suffer any consequent loss.

"The pole star, therefore, to guide you is that such a rate of fare only is to be charged as will be sufficient to give the best practicable service at cost, having regard to the comfort and convenience of the public who use the lines, their suitable operation by competent employees, the payment of a fair return on the investment and the protection of the investment as such.

"Under your administration the community can be protected no matter what the rate of fare may be; for, if it should happen that the rate of fare as charged by you is large enough to create a surplus the public can be certainly protected from any distribution of this surplus among the owners of the property by suitable stipulations and conditions in the permanent franchises which must, in the nature of things, be hereafter granted."

Attorney A. C. Dustin has announced that the stockholders and directors of the Municipal Traction Company may be asked to return the money that was paid out to the holders of guaranteed stock as dividends after the Cleveland Railway refused to make a definite promise of paying the rental money out as dividends. The amount so paid was about \$29,000, and if action is started to recover it, it will be on the ground of misapplication of funds.

J. B. Tanner has resigned as auditor of the Municipal Traction Company in order to aid the new State Treasurer of Ohio to reorganize the accounting system of the office. He became auditor of the company on Aug. 25. L. W. Blyth, of the firm of Ernst & Ernst, will fill the position temporarily.

The hearing on claims before Master Commissioner Belford has begun. Secretary Henry J. Davies and Attorney Harry J. Crawford are endeavoring to reach a decision regarding them, so that the attorneys for the company may decide each as it comes before the master. The work is progressing slowly. Considerable controversy arose over bills for material used in converting old cars to the pay-as-you-enter type. An attempt has been made to have all this material classed with the items representing maintenance and operation. The creditors are endeavoring to show that they did not know for what purpose the materials were to be used when the purchases were made. The claims of S. B. Clark and Bronson Winthrop for legal services were also brought up. Attorney Crawford objected to the amount of the claims and the classification. D. C. Westenhaver, attorney of the Municipal Traction Company, stated that in his opinion the claims are unclassified.

The notice issued by the receivers some time ago that all former employees of the Cleveland Electric Railway who desired to re-enter the employ of the company should file their applications by Jan. 5 in order to be preferred over others, has resulted in the filing of 800 applications. About 500 men had already been given positions.

On Jan. 18 the Standard Underground Cable Company and the Electric Storage Battery Company, creditors of the Municipal Traction Company, through their attorneys, A. V. Cannon and S. H. Tolles, respectively, filed a motion in the United States Circuit Court, asking that the receivers of the Municipal Traction Company be instructed to charge the fares provided for in the franchises granted to the several companies now included in the Cleveland Railway Company. The motion states that debts have accumulated against the Municipal Traction Company to the extent of more than \$400,000, all of which is unpaid. The receivers took over \$335,000 when they were given charge of the property. This amount was applicable to the payment of debts and expenses, but has been drawn upon, the motion states, by the receivers for the payment of taxes, fixed charges and other running expenses. The fund for the payment of creditors is thus being depleted. The motion takes the initiative for raising the fare from the receivers and puts it upon a court for decision.

#### Recommendations Affecting Subways in New York

The Public Service Commission of the First District of New York has made public Chapter II of its annual report to the New York Legislature. The necessity for new legislation regarding rapid transit in New York is discussed, specific recommendations are made for such new legislation, and there is an exposition of the action of the Board of Estimate of New York in not taking action regarding rapid transit progress in New York. Briefly stated, the commission recommends a constitutional amendment exempting rapid transit bonds from the consideration of the debt limit of New York City; an amendment providing for the termination of franchises at the time the franchise for the connecting main line expires; an amendment permitting construction by private capital, and payment of part earnings to

the city; an amendment putting extensions under the same law, practically, as new lines; an amendment to the Elsberg law permitting the granting of franchises for a longer term than 25 years, and an amendment having to do with the payment by operating companies of annual interest and sinking fund charges. The commission favors permitting the cost of rapid transit lines to be assessed in whole or part on the lands benefited, but says that it is not yet prepared to recommend a definite method.

In reviewing the history of the Elsberg law, passed, in the commission's opinion, when every one had an erroneous impression as to the probable earnings of the subway, the commission says:

"All know now that both sides were deluded as to the profits of subway railroads, because subsequent events and the experience of this city and others have furnished instruction. Subway operation does not prove so profitable or attractive as it appeared to be in 1904. The rapid transit board, believing that the law as it stood would obtain more subways for New York City on a safe basis, opposed the alteration of the Rapid Transit act, which would shorten the term of operation and make possible the separation of contracts for construction, equipment and operation. Later events show that some of the main features of the amendments were based on a miscalculation."

The main argument in favor of construction by private capital, the commission says, is that the rapid development of the city makes necessary more construction than can be accomplished with city money.

The report then takes up the loop subway line, now under construction, and the probable difficulty in getting an operating company when it is finished, urging that greater freedom should be given those empowered to make operating contracts. Next the commission asserts that it is not of the opinion that the city would have obtained a thoroughly effective subway system had the Elsberg law not been passed. The probable advantages of the assessment plan are gone into somewhat thoroughly, on the basis that, in undeveloped districts particularly, it would be well for the city to bear at least a portion of the burden of expense at the outset. The drawbacks of the plan are also dealt with, notably the possibility of the operation proving a losing venture in the beginning.

The commission's recommendations are:

"A constitutional amendment exempting from the 10 per cent debt limit bonds for the construction of rapid transit lines, when, so far and so long as such rapid transit lines shall be self-supporting.

"An amendment to the Rapid Transit act providing that operating contracts for extensions of rapid transit lines may be made to terminate at the same time as the original operating contract, this commission having the power in conjunction with the Board of Estimate to fix the terms, conditions and compensation and to readjust the same each 20 years thereafter.

"An amendment to the act which shall give this commission the power in conjunction with the Board of Estimate to allow the construction and operation of rapid transit lines by private companies upon payment of part of the earnings to the city, or other proper terms and with a reservation to the city to purchase at any time after a certain period not more than 20 years and without any payment for the franchise itself.

"An amendment to the act which shall give this commission the power, in conjunction with the Board of Estimate, to grant franchises to existing corporations owning rapid transit lines, to construct and maintain extensions or to lay and maintain additional tracks, with the reservation to the city of the right to purchase after a period of not more than 20 years.

"An amendment to the act making it possible for this commission, in conjunction with the Board of Estimate, to make operating contracts for a longer period than 20 years or else to make operating contracts terminable at any time after a certain period of not more than 20 years, with a provision that the equipment shall be purchased at a fair price by the city at the termination of the contract.

"An amendment to the act rescinding the requirement that the operator must pay interest and a specific annual sum for sinking fund on the entire cost of a rapid transit line, and permitting the commission and the Board of Estimate to adapt the operating contract to the specific needs of each case."

Then follows the history of the Fourth Avenue subway, Brooklyn, with a reference to the fact that while \$23,000,000 was supposedly set aside for the construction work, when the contracts were submitted not even \$2,850,000 was forthcoming, and that the Board of Estimate has been restrained from acting on the contract by a suit admittedly instigated by one of its own members. The report continues:

"If the board has acted unwisely in the past, desires to

change its action, and will do so, this commission will adjust itself to the new conditions. Several miles of new subway would now be under construction if the Board of Estimate had acted upon the contracts before it and authorized an expenditure of less than \$3,000,000."

**Resolution Urges Electrification of Buffalo Terminal Lines.**—Alderman Fisher, of Buffalo, has offered a resolution to the Council of Buffalo for the adoption of an ordinance that shall provide for the electrification of all the railroad lines now operated by steam within the city limits of Buffalo.

**Chicago & Oak Park Elevated Railroad Ordinance.**—The City Council of Chicago has resubmitted the pending ordinances of the Chicago & Oak Park Elevated Railroad to the local transportation committee at the request of Mayor Busse, who is said to be opposed to the 14-year franchise extension, but is willing to grant a franchise for an extension to Humboldt Park.

**Trial of Chester Strikers Postponed.**—The trial of the 13 men charged with complicity in dynamiting cars of the Chester (Pa.) Traction Company and with conspiring to damage the company's property and interfere with the operation of its cars during the recent strike, has been postponed until March. The bail in each case is \$1,000. At the first trial the jury disagreed.

**New Offer for Sale of Steinway Tunnel.**—It is stated that the Interborough Rapid Transit Company, New York, will soon make another offer to sell the Steinway tunnel under the East River to the City of New York. The previous offer of the company to sell to the city was rejected on Jan. 5 on the advice of the Public Service Commission of the First District of New York.

**Southern & Southwestern Railway Club.**—The Southern & Southwestern Railway Club was to meet at the Piedmont Hotel, Atlanta, on Jan. 21. The subject of headights was to be concluded and Mr. Klink was invited to address the club briefly on "Records of Shop Cost." The advisability of holding future meetings of the club in the new club rooms of The Mechanical & Manufacturers Club was to be considered.

**Newspaper Series on Boston Problems.**—As one of the answers to the question, What is the matter with Boston? the Boston *Herald* is publishing a series of 10 articles by George W. R. Harriman on the transportation problems of Greater Boston. Mr. Harriman, the author, is a civil engineer of Boston and has been employed as a special agent of the Interstate Commerce Commission. The articles are illustrated by numerous half-tones and line engravings.

**Consideration of Forty-second Street Tunnel, New York, Postponed.**—The Board of Estimate of New York on Jan. 15 postponed for two weeks consideration of the plan to build a tunnel on Forty-second Street from the Grand Central Station to Sixth Avenue, for all street railway and vehicular traffic. The junction of Fifth Avenue and Forty-second Street is one of the most congested traffic points in New York.

**Request for Information Regarding Broken Rails.**—The Public Service Commission of the Second District of New York has adopted a resolution requesting the steam railroads within its jurisdiction to report on or before March 1, 1909, the number of broken rails in service on their lines in New York State including the electrically operated portions of such railroads showing the weight of rail per yard, the year rolled, the name of the maker and whether the rail was made by the Bessemer or open-hearth process.

**New York Commission Disclaims Jurisdiction Over Electrification.**—The Public Service Commission of the First District of New York recently dismissed the application of the New York, New Haven & Hartford Railroad for permission to electrify the so-called local line between Mott Haven and New Rochelle, on the ground that it had no jurisdiction in the matter. Commissioner Bassett says that the New York, New Haven & Hartford Railroad may make the proposed change of motive power without obtaining the approval of the commission.

**Tenant Sought for Steinway Tunnel.**—At the meeting of the Board of Estimate of New York on Jan. 15, Herman A. Metz, comptroller of New York, offered a formal resolution asking the New York & Long Island Railroad to apply to the Board of Estimate for a franchise to operate the Steinway tunnel under the East River. Mayor McClellan and Patrick H. McGowan, president of the Board of Aldermen, succeeded in having the resolution held over, saying that it pledged the board to pass the franchise if the company applied for a grant.

**Pennsylvania Railroad Commission Presents Report.**—The Pennsylvania State Railroad Commission has presented

its first annual report to Governor Stuart. The commission reviews both street railway and steam railroad conditions within the State and recommends among other things the passage of a law to provide for the supervision by the commission of all increases in the capital stock of both steam railroads and electric railways. The commission also says that it should be given power to authorize the adoption by steam railroads and street railways of safety appliances at the grade crossings, and that trespassing upon the private right-of-way of steam or electric railways in Pennsylvania should be made a misdemeanor punishable by a fine or imprisonment.

**Suit to Prevent Passage of Low Fare Ordinance in Detroit.**—Arguments were begun in the United States Court of Appeals at Cincinnati in the Detroit 3-cent fare case on Jan. 8. The franchises that have expired in Detroit were for connecting links in various routes, for the most part short gaps in the lines. The city in renewing these undertook to impose a fare of 3 cents. The Guaranty Trust Company, New York, holder of first mortgage bonds of the Detroit United Railways, brought suit in the United States Circuit Court at Detroit to prevent the city from advertising the ordinance, as provided by law, and secured an injunction. The city carried the case to the Appellate Court. Attorneys for the Guaranty Trust Company contend that if the ordinance goes into effect it will impair existing contracts with the city and that further damages would result to the company.

**New England Railroad Club.**—The regular meeting of the New England Railroad Club was held at the Copley Square Hotel, Boston, on Jan. 12. The speaker was N. W. Storer, of the Westinghouse Electric & Manufacturing Company, and his subject was "Single-Phase Railway Systems." He discussed the limitations of direct-current transmissions for railway service, and pointed out the advantages of alternating current for long-distance work, with special reference to interurban practice and the electrification of steam railroads. He also emphasized the advantages of eliminating the rotary converter substation and substituting when necessary the stationary transformer installation which requires only occasional attendance. Part of the address was devoted to a description of the single-phase installation of the New York, New Haven & Hartford Railroad's terminal lines at New York, and was illustrated by the stereopticon. About 200 members and guests were present.

**Negotiations for Sale of Winnipeg Electric Railway to City.**—D. D. Mann, representing the Winnipeg Electric Railway, met the power committee of the City Council of Winnipeg, Man., on Jan. 16, regarding the sale of the property of the Winnipeg Electric Railway to the city. Mayor Evans said that the city was willing to take over the holdings of the company at a fair valuation and asked Mr. Mann to set a price on the property. Mr. Mann replied that he could not act without the authority of the directors of the company, but said that he knew that no arrangement for the sale of the property to the city would be entertained by the directors that did not provide a consideration for the franchise. This value, he said, the directors felt should be fixed at 6 per cent of the annual earnings of the company. This would mean that on the earnings of 1907, the company would want \$16,645,000 for its property and on the earnings of 1908 approximately \$19,000,000. On Jan. 18, Mr. Mann made an alternative proposition to the city, one of the features of which was a proposed reduction of 20 per cent in the price of commercial lighting providing the city would abandon its plan to build a municipal lighting station. The offer was rejected.

**New England Street Railway Club to Co-Operate with American Street & Interurban Railway Association.**—Matthew C. Brush, president of the New England Street Railway Club, has announced that he has appointed the following committee to co-operate with James F. Shaw, president of the American Street & Interurban Railway Association, in increasing the associate membership of the American Street & Interurban Railway Association: Henry C. Page, M. H. Bronsdon, A. H. Warren, Geo. W. Palmer, Jr., Franklin Woodman, Geo. W. Knowlton, H. R. Luther, W. D. Wright, E. P. Shaw, Jr., Robert S. Goff, J. H. Neal, F. J. Stone, C. A. Sylvester, John J. Lane. Members of the New England Street Railway Club who wish to become associate members of the American Street & Interurban Railway Association are requested by Mr. Brush to present their applications to any one of the above-named committee or to send them direct to John J. Lane, secretary of the New England Street Railway Club, who will forward them to the secretary-treasurer of the American Street & Interurban Railway Association in New York. Mr. Brush enclosed in his circular to members of the New England Street Railway Club a booklet regarding associate membership in the American Street & Interurban Railway Association.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

**Indiana.**—The Indiana Railroad Commission proposes to have introduced into the Legislature several measures which will cover points brought out in the study of electric railway and railroad conditions in Indiana made by it during the past year. One of the measures would impose a penalty for reckless driving of automobiles and wagons at grade crossings, and make it a misdemeanor for the driver of an automobile or vehicle to cross railroad tracks without first dismounting to observe whether a train or car is approaching. Another measure will make it a misdemeanor to trespass upon the right of way of steam or electric railways. The Indiana Manufacturers' & Shippers' Association has had a bill prepared for introduction, which provides for the enlargement of the power of the railroad commission so as to give that body supervision over the rates charged by street railway, gas, water, telephone and other public service corporations. Senator Stotsenburg has introduced a bill to permit toll road companies to construct electric railways on right of way. It is said that the purpose of this measure is to secure electric railway rights on the New Albany & Paoli Plank Road Company. A bill has been introduced to amend the employers' liability law so as include all common carriers.

**Massachusetts.**—A bill has been introduced in connection with the petition of Butler Ames for legislation to authorize the Boston, Lowell & Lawrence Electric Railroad to construct an elevated structure and subway in Lowell, Lawrence, Somerville and Boston. The proposed legislation is sought in accordance with the so-called interurban or electric railroad law of 1906 (Chap. 516), and the Railroad Commission is to pass upon the project as to locations, appurtenances, terminals, track facilities and its necessity. A bill has been introduced giving the Highway Commission power to order electric railways and other public service corporations to place their wires underground where the commission deems it consistent with safety and proper operation, the work to be done by 1914 in cities of more than 25,000 inhabitants, and by 1915 in all other places in the State. A bill has been introduced in which provision is made for the construction of a tunnel from Sullivan Square to the North Station, Boston, by the Boston Transit Commission.

**New Jersey.**—The Legislature convened on Jan. 12. In accordance with the recommendation of Governor Fort in his annual message that the authority of the Railroad Commission should be broadened and extended to include all public service corporations, at least two public utility measures will be presented shortly. In fact, Assemblyman Martin has already had a bill drawn which places all the public service corporations under State control and delegates rate-making power to the controlling body. Senator Gebhardt, the Democratic minority leader, will present a similar bill. The State Board of Agriculture of New Jersey, in session at the State House, Trenton, will consider the resolutions introduced with the approval of a special committee on railroad rates and transportation, demanding that the Legislature enact a public utility commission law, with rate-making features, and also that the present electric railway freight law be repealed. As now framed, the electric railway freight law cannot be utilized except where all the municipalities through which a street railway passes adopt ordinances with uniform regulations. This condition, it is argued, cannot be complied with by the companies, owing to the varying views in different town-governing boards over the question of how freight should be carried under the law.

**New York.**—Chairman Willcox, of the Public Service Commission of the First District of New York, and Chairman Stevens, of the Public Service Commission of the Second District of New York, have been in conference at Albany regarding the amendments to be made to the Public Service Commission law in accordance with the recommendations of Governor Hughes to the Legislature. Senator Travis has introduced the amendment to the Rapid Transit Act, which permits the construction of subways in New York by private capital. Assemblyman Robinson has also introduced the same bill. A plan to do away with the steam railroad tracks on Eleventh Avenue, New York, and other streets on the lower West Side of New York has been sent to the Legislature by the Public Service Commission of the First District. The plan is for the construction of a freight subway under the marginal streets of New York, and the report recommends the passage of an act which will allow the commission to grant a franchise for the building of the subway by private capital. To this end, it would be necessary, according to the report, to grant a franchise for more than 25 years, which is the limit allowed under the rapid transit laws, for otherwise it would be impossible to attract the necessary capital.

Financial and Corporate

New York Stock and Money Market

January 19, 1909.

The stock market in Wall Street has been dull during the past week and, in fact, there has been little trading except that of the professionals. Prices have fluctuated within a narrow margin, but the general tendency has been toward lower levels. The sales to-day amounted only to 597,000 shares, one of the smallest totals since the beginning of the new year. The copper stocks have been fairly well sustained in spite of the fact that the price for copper metal is lower and that there seems to be a vast over-production. This is due, of course, to the fact that the large financial interests back of the copper production and the copper stocks are determined that prices shall be maintained. There has been some activity in traction stocks, which is hardly explainable except upon the theory that the reorganization plans for the Metropolitan system are under way. So far, no announcement of these plans has been made. Interborough-Metropolitan preferred was active in to-day's market and recorded a break which was explained by the report that an assessment might be made if the company attempted eventually to take over the Metropolitan Street Railway. The stock recovered, however, and closed at almost as good a place as the opening.

There is still a good market for all kinds of bonds, and every offer that is made is absorbed without any apparent effect upon either the money market or the stock market. As long as the banks throughout the country continue to hold large cash balances the bond market will remain good. As short-time notes mature, the debts which they represent will be funded.

Money remains remarkably cheap when it is considered that there is serious disturbance in the European financial centers and that the Bank of England has increased its discount rate from 2½ to 3 per cent. The quotations to-day were for call loans, 1½ to 2 per cent, and for 90-day paper, 2¾ to 3 per cent.

Other Markets

In the Boston market, traction stocks have been inactive during the last week. Massachusetts Electric in both issues was offered for sale and prices were about those which have prevailed for some months past. The common sold up to 12¼ and the preferred sold for 59¼. Boston Elevated was traded in at 128¾.

In the Philadelphia market, Rapid Transit stock was the most active traction issue. This stock has been fairly active all week and closed at about the top figure for the present movement. Union Traction was also traded in to some extent, the average price being about 52.

In Chicago, tractions were almost entirely out of the market. A few shares of Metropolitan Elevated came to light and changed hands at about 50. Trading in the City Railway's rights has been very slow. There continues to be some market for Subway stocks.

In Baltimore the various bond issues of the United Railways Company continued to be active. While there is little trading in stock, there always seems to be a market for these traction bonds. The 4s are selling for 85½ and the funding 5s for 78½.

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

	Jan. 12.	Jan. 19.
American Railways Company, Philadelphia.....	*45½	45
Boston Elevated Railway.....	128¾	128¾
Brooklyn Rapid Transit Company.....	69¾	71¾
Chicago City Railway.....	180	*180
Cleveland Railway.....	—	—
Consolidated Traction Company of New Jersey.....	a73½	a75
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a104½	a105½
Detroit United Railway.....	*55½	*55
Interborough-Metropolitan Company.....	15	15¾
Interborough-Metropolitan Company (preferred).....	43	44½
Manhattan Railway.....	149	153
Massachusetts Electric Companies (common).....	11¾	12¼
Massachusetts Electric Companies (preferred).....	59	59¾
Metropolitan West Side Elevated Railway, Chicago (common).....	16	16
Metropolitan West Side Elevated Railway, Chicago (preferred).....	50	46
Metropolitan Street Railway.....	*42	*42
North American Company.....	73	*73¾
Philadelphia Company, Pittsburg (common).....	43¾	42¾
Philadelphia Company, Pittsburg (preferred).....	43¾	44
Philadelphia Rapid Transit Company.....	25¾	26
Philadelphia Traction Company.....	90½	91
Public Service Corporation, 5 per cent collateral notes..	—	a99½
Public Service Corporation certificates.....	—	*76½
Twin City Rapid Transit Company, Minneapolis (common)	100¾	*99½
Union Traction Company, Philadelphia.....	52	52¾

a Asked.  
\*Last sale.



**Annual Report of Quebec Railway, Light & Power Company**

Net earnings of the Quebec Railway, Light & Power Company for the year ended June 30, 1908, amounted to \$238,461. After the deduction of interest and preferred stock dividends a surplus was left of \$87,066, of which \$20,000 was transferred to the "accident insurance" account.

George H. Thomson, the president, says in his report to shareholders:

"Considering the financial stringency existing during the year, and the fact that the completion of our new power house and transmission lines was unavoidably delayed, and that no income was received from this source, your directors feel that the results are satisfactory.

"The new power house, transformer houses and transmission lines, etc., are now practically completed and have been in operation since the close of our year, with very gratifying results. We look forward with confidence to increased profits from this source during the current year.

"The proceeds from the sale of \$250,000 additional preferred stock will be used to pay off the floating indebtedness, the whole of which has been incurred in developing the resources of the company.

"We have pleasure in reporting that the company's operations during the late Tercentenary celebration were successfully carried out and that notwithstanding the crowded state of the streets and the large number of passengers carried, no accident of a serious nature was reported. As the festivities took place after the close of our financial year, the benefits accruing to the company do not appear in the figures of the present annual statement."

The report of Edward A. Evans, general manager of the company, says in part:

"The total number of passengers carried on the Citadel division was 6,049,203, an increase of 534,075 over that of the previous year. The average fare per passenger was 4.22 cents, as against 4.24 cents the previous year, but the income per capita of the population increased from \$3.24 to \$3.55, still an exceptionally low figure as compared with other cities.

"The operating expenses of this division have increased from 12.86 cents per car-mile to 13.64 cents; this is principally accounted for by the increased cost of labor and material, representing an increase of nearly half a cent per car-mile, and the increased cost of the removal of snow, representing nearly another quarter of a cent per car-mile; the exceptionally unfavorable climatic conditions last winter brought the total cost of snow removal up to \$17,380—the highest record since the inception of the road. Six new open cars and five new closed cars, as also five double electrical equipments, have been added to the rolling stock of this division during the year.

"It having been decided to build a new roof to the car barn of this division, plans were prepared for a steel and concrete roof, so as to render the building more secure from the risk of fire; this work is progressing satisfactorily and will be completed by the end of October next.

"For the information of the shareholders, it might be well to mention that during the Tercentenary, viz, from July 21 to 31, both days inclusive, this division carried 679,000 passengers, an increase of 412,000 over the corresponding period of the previous year, the largest number carried in any one day being 74,000.

"During the year, no fatal or serious accident happened upon this division.

"The total number of passengers carried on the Montmorency division was 1,398,345, an increase of 163,085 over the previous year. The average fare per passenger was 10.10 cents as against 10.40 cents last year. Upon the elevator at Montmorency 239,910 passengers were carried, as against 226,213. The freight business represents 111,001 tons, or 5826 car loads, an increase of 84,897 tons.

"The operating expenses upon this division have increased considerably, due to a variety of causes, but have, certainly for some considerable time, reached the maximum. The principal causes are: increased cost of labor and material, Government taxes (increased from \$10 to \$30 a mile) and the running of late trains to and from St. Anne and Quebec during the winter months. There was also a considerable expenditure for the use of foreign freight cars; since, however, the division has been provided with 30 additional flat cars received just before the close of our financial year, this expenditure will be very much reduced.

"During the summer, commencing July 6 last, a special tourist car, in charge of an efficient guide, has been run between Quebec and St. Anne Church, stopping only at Montmorency upon its return; this car has been extremely well patronized and, as a special fare is charged, it has so far proved very remunerative.

"It is pleasing to report again that there has been no

injury of any kind to passengers upon this division, and although there have been a few accidents to employees, the account for injuries and damages is nil.

"During the Tercentenary, on this division, 98,843 passengers were carried, an increase of 29,342 over the same period of last year."

**List of Holders of Securities of New York Companies**

The Public Service Commission of the First District of New York has completed from the reports of the street railway companies within its jurisdiction details of the stock holdings of individuals and corporations in the various companies. The Metropolitan Street Railway has not filed its report. The Brooklyn Rapid Transit Company is not an operating company and is not required to report. Among the large holders are:

**INTERBOROUGH RAPID TRANSIT COMPANY**

Capital stock.....	\$35,000,000
George B. Agnew.....	20,000
Frederick Ayer.....	145,600
E. M. Davison, Charles B. Ludlow and B. Bamburger, voting trustees.....	294,400
Windsor Trust Company, as trustee of the trust indenture of Interborough-Metropolitan Company.....	912,800
John C. Wilson.....	200,000

**MANHATTAN RAILWAY**

Capital stock, June 30, 1908.....	\$60,000,000
The executors and trustees under the will of Jay Gould, deceased.....	8,140,100
General Education Board.....	2,813,400
Henry J. Cammann.....	2,290,000
Russell Sage.....	1,247,800
Day, Adams & Company.....	1,045,500
J. H. Amory & Son.....	1,000,000
C. W. MacQuoid & Company.....	998,600
George P. Butler & Brother.....	909,000
Henry Phipps.....	710,000
C. P. Morosini.....	644,000
Louis M. Bailey.....	550,000
John Gilchrist.....	550,000
Harry I. Tuthill.....	510,000
Frank J. Irving.....	500,000
R. R. Hunter.....	450,000
James H. Hyde.....	401,000
Charles Head & Company.....	310,000
John McKay, Jr.....	340,000
University of Chicago.....	300,000

**NEW YORK CITY INTERBOROUGH RAILWAY**

Capital stock, June 30, 1908.....	\$5,000,000
Interborough Rapid Transit Company.....	2,741,000
Walter Lutgenn.....	395,000
Donald C. Roberts.....	233,900
George W. Young.....	170,000
J. Craig Havemeyer.....	134,000
H. McCarthy.....	100,000
William W. Little.....	100,000

**BROOKLYN CITY RAILROAD**

Capital stock, June 30, 1908.....	\$12,000,000
Mutual Life Insurance Company.....	1,237,000
Equitable Life Assurance Society.....	466,810
W. A. & A. M. White.....	303,220
Emily S. Watson.....	300,000
Estate of J. J. Studwell.....	277,500
David G. Legget.....	241,500
Lucy D. Rice.....	190,000
Charles Pratt & Company.....	190,560
Robert Walton Goelet.....	180,000
Trustees estate of Ludvic Benet.....	150,400
Continental Insurance Company.....	140,000
Charlotte B. Wilbur.....	120,000
William Rockefeller.....	110,000
Samuel W. Bowne.....	110,930
Seth L. Keeney.....	100,000
F. P. Olcott.....	100,000

**CONEY ISLAND & BROOKLYN RAILROAD**

Capital stock, June 30, 1908.....	\$2,975,300
Estate of Louis Fitzgerald.....	400,000
Estate of H. B. Hyde.....	400,000
James H. Hyde.....	289,800
Annie F. Hyde.....	107,500
Franklin Trust Company.....	50,000

**Annual Meeting of Interborough Rapid Transit Company**

The annual meeting of the stockholders of the Interborough-Metropolitan Company, New York, was held on Jan. 22. The retiring directors were re-elected. Theodore P. Shonts, president of the company, made the following statement with reference to the condition of the company:

"The conditions affecting your property have improved since the last annual meeting, although the general situation remains practically the same. Your equity in the property of the Interborough Rapid Transit Company is gradually increasing in value. The increase in earnings for October of last year amounted to \$70,000; for November, \$150,000, and for December, \$264,000. While this increase began in October, owing to business depression during the greater part of the year and consequent curtailment of travel, the results for the calendar year are practically the same as in the previous year.

"So far as the Metropolitan Street Railway, operated by the receivers, is concerned, it was also affected during the summer months by the business depression, but began

showing better results about the same time as the Interborough Rapid Transit Company did, the increase for October being \$22,700; for November, \$36,000 and for December, \$101,000.

Mr. Shonts is quoted as saying in an informal conversation with some of the shareholders after the meeting that the company had not yet decided whether or not it would retain its interest in the Metropolitan Street Railway, about \$43,000,000 of whose stock it holds.

**Atlantic Shore Line Railway, Kennebunkport, Maine.**—Announcement has been made that a syndicate composed of Earnest W. Goodall, George E. Goodall, Louis B. Goodall, Frederick J. Allen, Charles S. Cook and Arthur S. Bosworth and their associates has acquired control of the Atlantic Shore Line Railway. Charles S. Cook and Arthur S. Bosworth, both of Portland, Maine, have been elected directors of the company to represent the new interests.

**Buffalo & Lackawanna Traction Company, Buffalo, N. Y.**—The Buffalo & Lackawanna Traction Company has applied to the Public Service Commission of the Second District of New York for permission to issue a mortgage for \$1,500,000 covering its property.

**Chicago (Ill.) Railways Company, Chicago, Ill.**—The Chicago Railways Company announces that as successor through the Chicago Union Traction Company to the West Chicago Street Railroad and the North Chicago Street Railroad, it will redeem at 102 and interest on Feb. 1, 1909, the following equipment trust obligations issued by the West Chicago Street Railroad and the North Chicago Street Railroad: West Chicago Street Railroad, all of series C, Nos. 1 to 70, series B, Nos. 1 to 73, inclusive; North Chicago Street Railroad, all of series C, Nos. 1 to 38, and series D, Nos. 1 to 40, both inclusive.

**Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.**—The stockholders of the Fonda, Johnstown & Gloversville Railroad will meet on Jan. 26 to authorize an issue of \$1,000,000 of 6 per cent cumulative preferred stock.

**Gainesville (Ga.) Electric Railway.**—Upon the petition of the Knickerbocker Trust Company, New York, Judge Newman of the Federal Court has issued an order postponing the sale of the Gainesville Electric Railway from Feb. 2 to March 2.

**Manistee Light & Traction Company, Manistee, Mich.**—John P. Reynolds, Jr., has been appointed receiver of the Manistee Light & Traction Company by Judge Knappan of the Federal Court on application of the New England Trust Company, Boston, Mass., trustee of the first mortgage bonds. The company is alleged to have defaulted in the payment of taxes and interest and otherwise to have violated the provisions of the mortgage.

**Syracuse & Suburban Railroad, Syracuse, N. Y.**—A syndicate headed by John J. Stanley as syndicate manager has purchased the capital stock of the Syracuse & Suburban Railroad, Syracuse, N. Y. The company has organized as follows: John J. Stanley, Cleveland; C. Loomis Allen, Syracuse; James S. Sherman, Utica; Charles E. Hubbell, Syracuse; Giles H. Stilwell, Syracuse; H. C. Stone, Oneida; Maurice Rohrheimer, Cleveland; Edward Powell, Philadelphia; William P. Gannon, Syracuse; Granger A. Hollister, Rochester, and Chester H. King, Syracuse, directors; C. Loomis Allen, president; William P. Gannon, vice-president; Giles H. Stilwell, secretary-treasurer.

**Tarrytown, White Plains & Mamaroneck Railway, New York, N. Y.**—Justice Morschauer, of the Supreme Court, has confirmed the report of T. A. Atkins, referee, regarding the Tarrytown, White Plains & Mamaroneck Railway, and has appointed J. Addison Young permanent receiver of the company. The report of Mr. Atkins shows that the liabilities of the company exceed its assets by \$194,944.

**Third Avenue Railroad, New York, N. Y.**—Frederick Whitridge, receiver of the Third Avenue Railroad, has paid to W. A. Ladd, receiver of the New York City Railway, \$42,772 awarded to that company by Judge Lacombe as payment for a claim made in the Circuit Court for \$51,000 to cover the cost of coal and supplies used by the Federal receiver.

**Virginia Passenger & Power Company, Richmond, Va.**—The argument has been concluded in the United States Circuit Court of Appeals in the hearing of the appeal from Judge Waddill's decree ordering the immediate sale of the property of the Virginia Passenger & Power Company.

**Yonkers (N. Y.) Railroad.**—Application has been made to the Supreme Court at White Plains for the appointment of a permanent receiver for the Yonkers Railroad. George W. Alger, referee, has reported the company to be insolvent. Of the 10,000 shares of stock, 9880 are held by the Central Trust Company, New York. The Manhattan Trust Company, New York, holds a mortgage for \$1,000,000 covering the property of the company.

# Traffic and Transportation

## Hearing by Massachusetts Railroad Commission on Easthampton Service

The Massachusetts Railroad Commission gave a hearing on Jan. 14 on the petition of the selectmen of Easthampton for additional service between Easthampton and Northampton, Mass. J. C. Hammond, president of the Northampton Street Railway, presented a brief bearing upon the facilities and traffic now existing. An abstract of the brief follows:

"The Northampton Street Railway was incorporated in 1865, and for the first 29 years of its operation paid no dividends. For the last 16 years dividends have been paid. The company now operates 24.3 miles of road, of which 9.5 miles are the Easthampton line from the Boston & Maine Railroad station in Northampton through Easthampton to Mt. Tom junction. Regarding the request for more cars, the Railroad Commission is well informed by its own observations, from the annual reports made by all street railways, and from the thorough examinations made by its efficient inspectors. Tables have been prepared to show the results of a traffic count on the company's lines covering the travel between Northampton and Easthampton for the week beginning Jan. 5, 1909, and the passenger movement between Easthampton and Mt. Tom junction via East Street and in the opposite direction. They show the seating capacity of the cars, the type of car, and the number of passengers in each car at turnouts No. 17 and No. 13 for each trip during the day. The capacity of each single-truck car was 28 passengers, and of each double-truck car, 44 passengers. As Easthampton is located on a loop the inhabitants have 70 opportunities daily to take a car to Northampton, there being 35 round trips through the former town. On Saturdays and Sundays there are 10 more cars, and in every case the trip can be made for a single fare of 6 cents, regardless of the direction of the car. On Jan. 5, 41 double-truck car trips were made over the loop, the balance being single-truck car movements. The proportion of double-truck car service on other days in the record was about the same."

The average number of passengers counted in the cars in the different directions by days was as follows:

	Northampton to Easthampton.	Easthampton to Mt. Tom Jctn.	Mt. Tom Jctn. to Easthampton.	Easthampton to Northampton.
Jan. 5.....	13	6	7	13
Jan. 6.....	17	10	9	16
Jan. 7.....	15	8	9	15
Jan. 8.....	17	8	8	16
Jan. 9.....	22	13	14	22
Jan. 10.....	17	16	16	15
Jan. 11.....	16	8	8	15

On Jan. 9, the day of largest traffic, 90 cars were run over the Easthampton line. The earnings per car mile were as follows, for the period of the count:

Jan. ....	5	6	7	8	9	10	11
Cents per car mile....	14.7	16.9	16.7	16.3	23.2	20.0	16.

The figures filed showed that the number of trips on which standing passengers were counted was very small in proportion to the total number run, the tabulated results being as follows:

	TRIPS IN WHICH PASSENGERS STOOD.		
	Total trips.	Trips by single-truck cars.	Trips by double-truck cars.
Jan. 5.....	70	2	2
Jan. 6.....	70	2	1
Jan. 7.....	70	1	1
Jan. 8.....	70	4	3
Jan. 9.....	90	9	11
Jan. 10.....	60	4	0
Jan. 11.....	68	2	2

Judge Hammond stated that in the rush of the holiday season all lines were crowded at certain hours of the day beyond the figures of January. Chairman Hall of the Railroad Commission stated that if the company's figures are correct there appears to be no congestion on the road, although it is open to question whether there would be congestion with a 5-cent fare. The whole question is embarrassed because the fare unit has been altered, but the petitioners do not show that congestion exists, in general.

Judge Hammond pointed out in his brief in continuation that the service on the Easthampton line has always been about 25 per cent in excess of that furnished on any of the other three lines. The receipts from fares on the car-mile basis are invariably less on the Easthampton line. In 10 days in November, 1908, considered, the results were:

Bay State line.....	18.25 cts. per car mile
Williamsburg line.....	21.31 cts. per car mile
Holyoke line.....	25.75 cts. per car mile
Easthampton line.....	15.82 cts. per car mile

For December the patronage of the Easthampton line per car mile was almost exactly 25 per cent less than the average of all lines. On the line from Easthampton to

Northampton the through passenger average is only 16.2 per car. This line is especially for suburban service, and the patronage fluctuates more than on city lines which have more varied demands. The company has made every possible effort to meet demands for heavy riding when they can be foreseen. Demands which overload cars cannot always be seen or remedied, as on Saturday nights. An unusual added demand like theater travel may require attention at the same time that other travel occurs, and in such case all the cars on all the lines will be unavoidably overcrowded. Regarding complaints of the theater service in Northampton Judge Hammond said that a full house frequently requires two extra cars on each of the four lines of the company; these cars must be assigned before the play is out, and the time cannot be determined within 10 or 15 minutes. On a single-track road there must at times be a few minutes wait to some passengers.

The total transfers used on the system are 8 2/3 per cent of the register readings, and the Easthampton line uses about one-third the total transfers asked for. There are 21 double-truck car round trips on the Easthampton line compared with 7 double-truck trips on the Williamsburg and only 15 single-truck Easthampton trips compared with 24 on the Williamsburg. The company believes that it has ever maintained a high grade of efficiency and service.

The hearing was continued by the Railroad Commission, with the suggestion that a conference be held between the town representatives and the company in the effort to arrive at a mutual understanding of exact changes locally desired.

#### Receiver Whitridge on Ambulance Chasers

Frederick W. Whitridge, receiver of the Third Avenue Railroad, New York, who has been greatly annoyed by unscrupulous lawyers who make a specialty of accident cases, since he has been in charge of the property has had introduced in the Legislature a bill providing that the lawyer for the plaintiff in damage suits shall pay the cost. Mr. Whitridge himself is a lawyer. The bill reads, in part:

"Where an attorney or attorneys enter into an agreement or a contract with a party having an action against a defendant to recover damages for personal injuries, death as the result of personal injuries, or damages to personal property by reason of negligence, giving such attorney or attorneys a contingent interest in a future judgment or settlement of an action or claim, before judgment, or where such attorney or attorneys enter into an agreement or contract with any person or persons having a contingent agreement or a contract in such an action for a share of such contingent agreement or contract, or where such attorney or attorneys is or are attorneys of record in such an action, such attorney or attorneys shall be liable for the costs and may be required to file an undertaking as prescribed in Section 3272 of this act."

In connection with this legislation Mr. Whitridge addressed the following letter to the daily newspapers:

"I send you herewith a copy of a bill which has been introduced into the Assembly, and which I venture to commend to your attention and to ask you—so far as it meets with your approval—to advocate its passage.

"There are thousands of accidents on the surface roads of this city, many of them inevitable because of the traffic conditions and the absence of the regulations which exist in many cities of Europe, compelling pedestrians, except upon their own peril, to cross the streets only at the crossings.

"A class of lawyers has been developed by this circumstance who make it a regular business to seek and promote claims against the railroads upon a contingent basis which runs as high as 50 per cent, and is seldom less than 20 per cent of the amount recovered.

"In my experience of a year I have found that the amount which the lawyer was able to obtain over and above the amount which the client would have obtained in any case never exceeded the amount of the contingent fee. That is to say, the injured person was just as well off without a lawyer as he was with one.

"This may not be true in the case of all railroads, but in the case of the Third Avenue Railroad it is the desire of the management to see that every one who has been injured through the fault of the company shall be compensated for that injury, and I avoid litigation wherever I can.

"I believe in every civilized country it is the rule that a plaintiff who goes into court and is defeated is responsible for costs. In most countries these costs include the expense to which the defendant has been put by reason of litigation. In this State it includes, however, only certain costs fixed by the code, which never exceed \$50 or \$100.

"So long as an attorney is at liberty to take any sort of a case and subject the railroad to the expense of defending

it, many cases are brought which are not meritorious and a considerable number which are positively fraudulent, and it seems to me to be just and fair—I hope it will seem so to you—that an attorney who has got a large interest in the claim should be liable for the costs in case he is defeated and his client cannot pay the same, and though the liability is, as I say, not over \$50 or \$100, I am satisfied that some such amendment to the law as that I am now proposing would sift the claims which are brought against the railroad and dispose of or prevent the bringing of many which are fraudulent."

#### Service in New York

The Public Service Commission of the First District of New York has passed the following resolution calling upon the receivers of the Metropolitan Street Railway, New York, to file by Jan. 25 a report of the number of cars assigned to the various lines of the company:

"Resolved, That Adrian H. Joline and Douglas Robinson, receivers of the Metropolitan Street Railway, be required to file by Jan. 25, 1909, the following information:

"(a) For each line or route specified in their tariff schedules the number of cars of each type, classified according to seating capacity, used thereon or assigned thereto, stating which, upon the following days:

"July 1, 1906; Oct. 1, 1906; Jan. 1, 1907; April 1, 1907; July 1, 1907; Oct. 1, 1907; Jan. 1, 1908; April 1, 1908; July 1, 1908; Oct. 1, 1908; Jan. 1, 1909.

"(b) The number of new cars of each type purchased for use upon each of the lines given under (a) above between July 1, 1906, and Jan. 1, 1909, with dates when they were put into operation.

"(c) The number of cars of each type withdrawn from use upon each of the lines given under (a) above, between July 1, 1906, and Jan. 1, 1909, with dates when they were withdrawn.

"(d) The number of cars of each type which have been ordered but not yet delivered, with approximate date when they will be delivered."

A hearing will be held by the commission on Jan. 26 to determine whether the service of the Metropolitan Street Railway, New York, on the Fourteenth Street and Williamsburg Bridge line should be increased.

#### Experimental Side-Door Subway Train in New York.—

The Public Service Commission of the First District of New York has announced that the first of the Interborough Rapid Transit Company's experimental side-door subway trains will be placed in operation at a date not later than Feb. 5.

#### Cost of Dummies for Tests by New York Commission.—

The Public Service Commission of the First District of New York has presented a bill for \$3,524.15 to the Board of Estimate of New York for the dummies used by the Commission in the elaborate tests of fenders conducted by it recently at Schenectady and Pittsburg.

#### Pay-As-You-Enter Cars on Van Buren Street, Chicago.—

Pay-as-you-enter cars have been placed in service on the Van Buren Street line of the Chicago Railways Company. This is the sixth trunk line of the company which has been equipped with the new cars. The company now has a total of 250 pay-as-you-enter cars in service on its lines.

**Freight Service over Dayton & Western Branch of Ohio Electric Railway.**—The freight service over the Dayton & Western branch of the Ohio Electric Railway, which was suspended more than a year ago on account of litigation in Richmond, Ind., regarding franchise rights, was re-established on Jan. 9, and through freight is now being handled between Indianapolis and points on the Ohio Electric Railway in Ohio.

**Accident on Brooklyn Elevated.**—Two cars of an elevated train of the Brooklyn Rapid Transit Company jumped the track on Broadway near the Myrtle Avenue station on Jan. 15. There were about 50 passengers, mostly women, in the derailed cars. The only injuries they sustained were slight and were due to the panic among them to escape from the cars. The accident is said to have been caused by the splitting of a switch.

**Consideration of Passenger Tariffs by Central Electric Traffic Association.**—A meeting of the Central Electric Traffic Association was held in the office of Chairman A. L. Neereamer, Indianapolis, Ind., on Jan. 14 and 15, for the purpose of checking in rates for the new joint passenger tariff now under consideration. About 25 of the companies in Ohio and Indiana were represented. The next rate meetings of the association will be held at the office of Chairman Neereamer on Jan. 27, and on Feb. 12 and 13.

## Personal Mention

**Mr. Alfred Anderson** has been appointed purchasing agent of the Metropolitan Street Railway, New York, N. Y.

**Mr. Eugene Holcomb** has resigned as general manager of the Indianapolis, Crawfordsville & Western Traction Company, Indianapolis, Ind.

**Mr. John P. Hartman** has been elected secretary and treasurer of the Loyal Railway Company, Seattle, Wash., to succeed Mr. I. D. Trenholme.

**Mr. Alfred F. Pratt** has been elected treasurer of the Winona Interurban Railway Company, with headquarters at Winona Lake, Ind. Mr. Pratt is an attorney, with offices in Indianapolis.

**Mr. D. S. Carll**, second vice-president and general manager of the Capital Traction Company, Washington, D. C., has been elected president of the Washington Society of Engineers.

**Mr. Arthur Wagner** has been appointed train dispatcher for the Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind. Mr. Wagner was graduated from Purdue University and has been connected with the Fort Wayne & Wabash Traction Company at Peru.

**Mr. F. K. Breckenridge** has been appointed superintendent of purchases and stores of the Waterloo, Cedar Falls & Northern Railway, to succeed A. I. Breckenridge, deceased. Mr. F. K. Breckenridge's duties will include those of purchasing agent and general storekeeper, which positions have been abolished.

**Mr. C. O. Vandevanter**, who resigned recently as chief engineer of the United Railways & Electric Company, Baltimore, Md., proposes to open an office in Baltimore as an independent consulting engineer. Before becoming connected with the United Railways & Electric Company Mr. Vandevanter and Mr. J. M. Hood, Jr., who succeeds him as chief engineer of the company, were associated as consulting engineers, with offices in Baltimore.

**Mr. Joseph W. Bailey**, who was recently appointed superintendent of the Ogden (Utah) Rapid Transit Company to succeed N. C. Flygare, deceased, has been connected with the street railways of Ogden since 1888, when he entered the employ of the Ogden Street Railway. The cars in Ogden were operated by mules at first, but in 1891 steam dummies were placed in service and a number of extensions were constructed to the system. Mr. Bailey served in the repair shops of the company and as engineer on the dummies. In 1895, the Ogden Street Railway changed the motive power of its lines to electricity and during the reconstruction Mr. Bailey acted as superintendent of electrical equipment. Subsequently he became foreman of the principal car barn of the company and remained in this position until Jan. 1, 1900, when he was elected sheriff of Weber County, which position he held until March 5, 1905, when he resigned to become assistant superintendent of the Ogden Rapid Transit Company, which succeeded the Ogden Street Railway.

**Mr. John N. Ackerman** has been appointed general superintendent of the Atlantic City & Shore Railroad, Atlantic City, N. J., to succeed Mr. S. S. Neff, who resigned recently to accept another position. Mr. Ackerman has been connected with street railway properties throughout the United States for more than 25 years. He was born in Brooklyn on March 4, 1854, and began his railroad career in 1873 with the South Boston Railroad. In 1877 he became connected with the Middlesex Railroad. Subsequently he became superintendent of the Charles River Street Railway, Boston. Four years later, when this company was consolidated with the Cambridge Railroad Mr. Ackerman was appointed general superintendent of the Worcester (Mass.) Consolidated Street Railway. Later he negotiated the sale of the electric railways in Newark and Elizabeth, N. J., and in Worcester. He then became connected with the Elizabeth, Plainfield & Central Jersey Railway and when the property of that company was sold to the Public Service Corporation entered its employ, holding the positions, in turn, of traffic superintendent, general passenger agent and general superintendent of the South Jersey division.

**Mr. L. H. Conklin**, who, as noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 16, has resigned as general superintendent of the West Penn Railways Company to become general manager of the Scranton (Pa.) Electric Company, was graduated from Pratt Institute, Brooklyn, N. Y., in 1891. From 1891 to 1894 he worked in various capacities in several manufacturing plants to gain practical experience, and in 1894 became expert on the arc apparatus for the Excelsior Electric Company, which then manufactured the arc machines designed by Mr. Wm. Hockhousen, to whom Mr.

Conklin afterward became chief assistant. From 1896 to 1900 Mr. Conklin was superintendent of the electric plant of the Flatbush Gas Company, Brooklyn, N. Y., and from 1900 to 1904 he was a member of the firm of Weideman & Conklin, New York, which business is still being conducted. In the spring of 1905 Mr. Conklin entered the employ of Mr. A. M. Young, a director of the American Gas & Electric Company and several other electrical companies, for whom, as engineer in the New England territory, he rebuilt and modernized several electric light plants and constructed an electric railway. In the spring of 1907 Mr. Conklin became connected with the West Penn Electric Company, Pittsburg, Pa., as superintendent of lighting, and in August, 1907 was appointed general superintendent of the West Penn Railways Company, the West Penn Electric Company, McKeesport & Greensburg Railway, Westmoreland Light, Heat & Power Company and the Latrobe Street Railway, constituting what is known as the West Penn System. He is a member of the American Institute of Electrical Engineers and is president of the Pennsylvania Electric Association.

### OBITUARY

**A. I. Breckenridge**, purchasing agent and general storekeeper of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., is dead. Mr. Breckenridge was born in Meriden, Conn., on Aug. 12, 1845, and was graduated from Trinity College, Hartford, in 1870. He entered business in Brooklyn, N. Y., in 1871, but in 1873 removed to Waterloo, where he became a member of a firm of coal merchants. Later he entered the real estate business. Mr. Breckenridge had been purchasing agent and general storekeeper of the Waterloo, Cedar Falls & Northern Railway about two years.

**Joshua Rhoades**, who was prominently identified with street railway companies of Pittsburg for many years, died in Pittsburg recently. Mr. Rhoades was born in London, Eng., on March 19, 1824, and was brought to the United States by his father and mother in 1828. Mr. Rhoades' parents lived in Albany, N. Y., at first, but later moved to Buffalo and finally to Allegheny. When Mr. Rhoades was 12 years old both his parents died, and he immediately sought employment. A few years later he became interested in river traffic and opened a ship chandlery business at New Orleans. This he sold to return to Pittsburg, where he became interested with Mr. James Verner in the firm of Joshua Rhoades & Company, wholesale grocers. The fire of 1845 destroyed the company's property, but its plant was soon rebuilt and new members were taken into the firm. In the meanwhile Mr. Rhoades had become interested in the Pittsburg & Lake Erie Railroad, and with former associates bought the property of the Creston Tool Company, in Soho, which eventually became the Pennsylvania Tool Company. Anxious to increase the business of this company, Mr. Rhoades assisted in organizing the National Tube Company, of which he was made president and in which capacity he served until the property of the company was taken over by the United States Steel Corporation. During this active business career Mr. Rhoades became interested in the first horse car line in Pittsburg and later in the building of the Pittsburg, Allegheny & Manchester Railway. He also took an active part in the movement to electrify the horse and cable lines in Pittsburg and was elected president of the Consolidated Traction Company. At the time of his death Mr. Rhoades was a director of The Philadelphia Company, the Pittsburg Railways Company, the Freehold Bank, Colonial Trust Company, Keystone National Bank, Columbia National Company, Bessemer Coke Company, American Window Glass Company, Cherry Valley Iron Company and the Pennsylvania Casting & Machine Company.

The **Fourth Annual Electrical Show at Chicago** was opened on Saturday afternoon, Jan. 16, and admission during the afternoon was by invitation only. This prevented overcrowding and was generally approved. Among the exhibitors are: Allis-Chalmers Company, Milwaukee, Wis.; American Steel & Wire Company, Chicago, Ill.; A. & J. M. Anderson, Boston, Mass.; Chicago Pneumatic Tool Company, Chicago, Ill.; Crane Company, Chicago, Ill.; Electrical Testing Laboratories, New York City; Fort Wayne Electric Works, Fort Wayne, Ind.; General Electric Company, Schenectady, N. Y.; International Correspondence Schools, Scranton, Pa.; H. W. Johns-Manville Company, New York City; Kellogg Switchboard & Supply Company, Chicago, Ill.; McRoy Clay Works, Brazil, Ind.; National Battery Company, Buffalo, N. Y.; Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y.; Swedish-American Telephone Company, Chicago; United Pump & Power Company, Chicago; Wagner Electric Manufacturing Company, St. Louis; Westinghouse Electric & Manufacturing Company, Pittsburg.