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### Mixing Paint

The tricks of the painter's trade are many and like most other classes of employees, painters will too often save themselves labor when they can at the expense of the quality of their work. One of the commonest ways of shirking is to thin out paint with turpentine and thus make it easy to spread. It is difficult to detect thin paint after the first coat is applied, but the consequences of this labor-saving expedient are evident after a few months' exposure. The best way of preventing this and similar reprehensible prac-

tices is to issue paint and supplies from the paint storeroom just as tools are issued from the toolroom of the machine shop, and to allow no one but the paint-shop foreman to have access to the storeroom or to mix paint. This plan insures economical use of painting supplies and uniformity in color and quality of the paint applied.

### The Central Electric Traffic Association

At the annual meeting of the Central Electric Traffic Association the satisfactory statement was made by Chairman Neereamer that the organization of the Central Electric Railway Association is now on a sound financial basis. It was necessary that adequate arrangements of this character be made before the traffic association could begin to do the work for its members which its organizers planned. After the completion of the selling and basing fare sheet, upon which work is now in progress, there will still be, Mr. Neereamer states, "An open field for the labors of the traffic association." The Central Electric Traffic Association had the misfortune to start on its career during a period of declining business, political campaign and financial unrest. That it survived this discouraging combination of circumstances is creditable to Mr. Neereamer and his supporters. The association is now demonstrating that it occupies a position where it can be of unquestioned assistance to its member companies. Its usefulness should continue to increase as the possibilities of long-distance passenger traffic and of profitable express business are realized more clearly.

### Distributing Fare Increases

By its decision disapproving of the increase of fares from 5 cents to 8 cents on the Town Farm line of the Lawrence & Methuen Street Railway Company, and its suggestion that the company appears entitled to a distributed increase over the system as a whole, the Massachusetts Railroad Commission affirms the principle that an operating property must be considered as a whole, and that the burdens of the less profitable portions of a system must be carried by the entire road. In this case a 5-cent fare was charged by the company for transportation over practically equivalent distances on others of its lines, and as the company desired to equalize the poorer returns of the not inaptly designated Town Farm division without affecting traffic on the balance of the system, it was deemed expedient to increase the fare on the lightly patronized line from 5 to 8 cents. In view of the difficulties of determining just what are the operating costs on branches of railway systems, it is gratifying that a way is thus opened for the company legitimately to increase its revenues, if it so desires. In the last analysis a reasonable return on the investment required to give the service needed after pay-

ing all operating costs and fixed charges is all that an operating company can desire, including, of course, a substantial accumulation of reserve funds to meet the contingencies of the future. Fundamentally, it matters less how this necessary increase shall be obtained than that it shall be assured. While the company's practice in this case is not sustained by the commission, an alternative method capable of producing substantially the results desired is suggested.

### Committees to Assist the Manager

Every large railway system has on its staff men who are especially well qualified to pass judgment on some one feature of railway construction or operation. How, then, to get the utmost value from the services of such men is a problem in management. One method, and a good one, used on the Illinois Traction system in solving important problems is to place the consideration of their solution in the hands of specially appointed committees chosen far and wide from the department heads, and selected only with regard to the knowledge which may be useful in solving the new problems to the best advantage of the company. When a detail of operation is to be considered, such a problem, for instance, as the choosing of schedules for a new branch line or the task of determining the number and character of cars necessary to serve a city line to be opened at some future time, the general manager details from the departments most interested a committee of three or four men to study the problem, investigate the possibilities for solution and recommend to him the best means or methods to be used. Other questions would be referred to committees made up of different classes of men. After those who have been delegated to study any problems have pursued the work to the extent of their ability, they formulate a report, which is addressed to the general manager, who thus has all the essential data required for a decision. This method of handling problems of construction and operation not only has the advantage of saving time and affording the maximum reliability of judgment, but it also has an educational value by forcing the men to study the details of their work not ordinarily encountered.

### Government Regulation of Corporations

The inviolability of vested rights in property, as guaranteed by the Constitution, has long been the keynote in the relations existing in the United States between capital and the public. But the most far-seeing financiers realize that even vested rights must yield for the public welfare and safety whenever, for any reason, they assume a position really antagonistic to the rights and privileges of the great mass of individuals composing the country's population. A fuller realization of this fact is tending to bring about a fair and rational relationship between the interests of capital on the one hand and those of the people who have made possible the acquisition of wealth by capitalists on the other hand. In the course of a banquet speech in New York last week Elbert H. Gary, chairman of the board of directors of the United States Steel Corporation, dwelt on the need of recognition by capital of the sacredness of the rights of the public and the danger of defiance and disregard of these rights by so-called vested

interests. In the course of his remarks on that occasion he said:

Rights of the individual are subordinate and must submit to those of the public. The opportunities for the acquisition of wealth have been and are so great that large and increasing fortunes of individuals and corporations compel the most thoughtful men to dread the results of the future unless the influence and power of money can be controlled by government authority. The question is too far-reaching to be laughed out of court. If the power of accumulated money be not so controlled, who can tell when or how and to what extent it may be attacked by the mob?

The tendency of the times, we believe, is yet very far away from social revolution and confiscation of private or corporate property, but such a warning is worthy of attention, coming as it does from a man of the standing of Judge Gary, who represents the largest single aggregation of capital in the world. The wave of unreasoning public antagonism toward corporations and wealthy individuals is noticeably subsiding. In its place a widespread movement has been begun toward government regulation of corporation activities, which, if wisely administered, will protect alike the public and the owners of corporation securities from extortion, exploitation and unfair dealing.

### Specialists in the Shops

The remarkable record of the Third Avenue Railroad in reducing equipment failures during the past eight months, which is described in detail elsewhere in this issue, was brought about very largely through adopting a policy of having all car repair work done at one place and selecting specialists who are held responsible alone for maintaining a single part of all cars. It is reasonable that a man who does nothing else but pack journal boxes, for example, will in time become more expert in this operation than another man who does all kinds of work on a car. Every detail of shop maintenance and repair work requires some degree of expert skill. The tendency in all large manufacturing establishments is toward specialization, and specialization leads naturally to piece work.

It is not always easy to establish a piece-work system in repair shops on repair work, but the practice of the Philadelphia Rapid Transit Company is interesting in this connection. This latter company has put nearly all of its shop employees on this basis of individual effort, and has also made a point of specializing in every detail of its maintenance and repairs. For example, the Philadelphia company is running some of its heavy elevated cars for periods exceeding 15 months without adding a drop of oil to the journal boxes. One man has entire charge of packing, oiling and inspecting the journals, and no other shop employee is permitted to disturb the packing or add oil. When it is necessary to remove wheels and axles the journal expert superintends the removal of the journal boxes and replaces them on the axle. A record of 15 months continued running without lubrication is remarkable and, of course, it would not be possible to make such a record without using the very best quality of packing and oil and having journals which are well designed. Nevertheless, the secret of the long life of packing in journals is largely due to the careful and expert inspection and maintenance of the one man who has charge of this detail.

This principle is carried out in other departments of the same company's shops. For instance, in the armature department one man does nothing but soldering and another man does nothing but turn commutators; the armature winders are entirely relieved in this work. In another department one man babbitts all bearings and is responsible for the composition of the metal as well as the quality of the finished bearings. Too much stress cannot be laid on the troubles arising from ignorant and irresponsible workmanship in isolated car houses. It is not possible for one inspector personally to supervise all of the pit men in a large depot, and if they are permitted to make repairs, repack journals and do similar work, their lack of skill is sure to manifest itself in trouble later on.

### Retailing Railway Power

In the promotion of many interurban lines one of the benefits widely heralded has been the availability of electric light and power for all farms and villages along the route. How little current is being sold to rural customers is best known to interurban railway men. It is possible that the field mentioned by the promoters may profitably be more vigorously cultivated.

At a recent meeting of the Central Electric Railway Association in Indianapolis, G. H. Kelsay, superintendent of power, Indiana Union Traction Company, described the electrical equipment necessary for supplying light and power to consumers direct from interurban transmission systems. One point clearly brought out by this interesting paper, but not directly stated in it, is that during the last few years the manufacturers have greatly improved the electrical equipment necessary for furnishing this service. It is far more practicable now than ever before to supply light and power customers from railway transmission circuits.

The load factor of almost every interurban power station is quite generally recognized as being notoriously bad. Were it commercially possible in railway plants to obtain smooth load curves, the cost of power could be lessened considerably. Therefore, any method or means for accomplishing this end in a way consistent with good operating policy should be welcomed. The sale of power for commercial use offers one convenient and simple method.

The chief advantages to be obtained by the sale of current fed from transmission circuits are: (1) Increased revenue and (2) better load factor on the generating units.

It was suggested in the article earlier referred to that the cost of power can very closely be determined by railway accountants, and, therefore, the task of ascertaining what rate must be charged for power sold from a transmission system should not be difficult. If, on the other hand, an attempt is made to set down the detailed costs which enter into the production and the delivery of power from a small isolated plant, furnishing comparatively few consumers, the figures should be scrutinized most carefully before being accepted as correct. When an electric railway freight or express service is instituted it is improper, from an accounting standpoint, to assume that the general expenses of the road are not increased or that the new traffic should not bear its proportion of the cost

of superintendence, power generation and distribution, and maintenance. The cost of supplying power for commercial purposes from the railway circuit, however, can fairly be considered upon a somewhat different basis. If it simply reduces the load factor it may be classed simply as a by-product. As Mr. Kelsay puts it, "A dollar earned from the sale of current for power and lighting does not add a cent to the cost of some of the heaviest investments which make up the cost of traction lines. It adds only to the fixed and operating costs of the power station and transmission system, and a small expense to the auditing department and management, representing approximately only 15 to 20 per cent of the total operating charges on interurban railways."

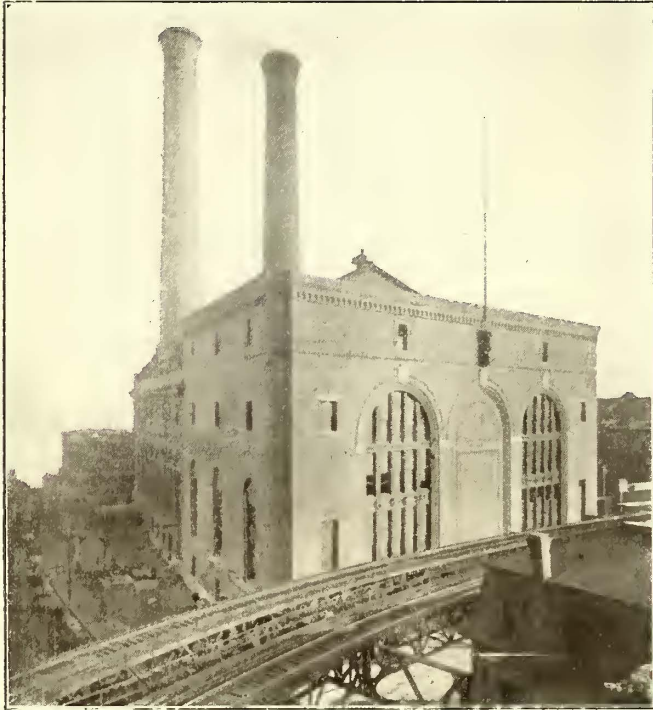
Referring again to the load factor, it will be often found that demands made for lighting and commercial power not only smooth the load curve of each day, but also the yearly load curve. Interurban railway service makes its most severe calls upon the power plant for current during the summer months, when travel is at its maximum. Sundays, Saturdays and holidays are the times of peak railway loads, but ordinarily are also the times when the current demands for lighting and power uses are at a minimum. In the winter months, when the lighting load may be expected to be at its maximum the railway load will be at its lowest point.

The service, of course, on account of the reliability which must exist in railway work, would be far better than usually is obtained in small power stations. A question on this subject which undoubtedly first comes to mind is: Could the railway company in selling current from its transmission system assure the consumer good voltage regulation? This question Mr. Kelsay answers by calling attention to an extreme case within his own experience on the Indiana Union Traction system. Near Indianapolis, at the end of the transmission system and approximately 40 miles from the power plant, current is used for lighting a large and important public building. This current is taken directly from the three-phase railway high-tension transmission system. The voltage is reduced through static transformers with the secondaries star-connected and the neutral grounded. While there are excessive fluctuations of load on the transmission system, the distribution from the low-tension side of the transformers is said to be made at a far more steady voltage than that ordinarily given by isolated plants in small towns.

An interurban railway soliciting lighting business should bear in mind that there are times when if cars are not running it may be necessary to make repairs on the transmission circuits. If a lighting consumer at such a time needed any considerable amount of current and could break his contract if current were not available, then the company might be embarrassed. It should also be remembered in soliciting that the best consumers would be those whose load demand would not occur simultaneously with the maximum traffic on the cars. There are, of course, other than these, all the usual conditions regarding the sale of current which a lighting company must observe, and which should carefully be considered before a railway transmission system is called upon to carry any considerable additional load.

### POWER PLANT EXTENSIONS OF THE BOSTON ELEVATED RAILWAY COMPANY

Extensive enlargement of the power plants of the Boston Elevated Company was carried out and completed about a year ago by the Stone & Webster Engineering Corporation, but the details of the work have not been available until the present time. In December, 1906, the



Power Station Improvements in Boston—Exterior of Lincoln Wharf Station

engineers were called upon by the Boston Elevated Company to study the power situation of the elevated and surface lines of Boston. Investigation showed that 7500 kw in additional electrical equipment was needed immediately and that the shortage would in the course of an-

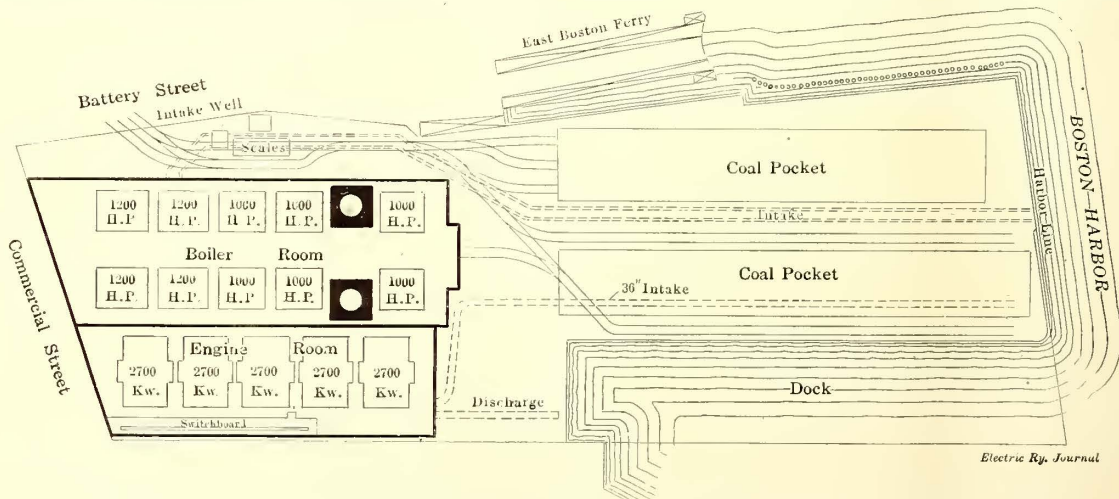
The emergency installation of 10,800 kw consists of four 2700-kw units distributed among three power stations. Two of the units were added to the Lincoln Wharf station, located on the harbor front in the heart of Boston proper, and one each to the Harvard station in Cambridge and the Charlestown station, on the Mystic River, in Charlestown. It was stipulated that these new installations should be ready for service within one year, or by Feb. 1, 1908. At the same time still earlier completion was desired in order that the equipment might relieve the old stations before the next succeeding period of heavy winter traffic, and the work was pushed with this end in view.

The stations were maintained in regular operation throughout the period of enlargement. Some serious physical difficulties interfered with rapid work. The construction was of a heavy and permanent character, and was at no point compromised for the urgent time requirement. Notwithstanding these adverse circumstances the desired time was made. The work was finished within 10 months, so that the various units were ready to go under commercial load.

#### LINCOLN WHARF STATION

The Lincoln Wharf power station furnishes electrical energy for the surface and subway lines in the heart of the city, as well as for a large part of the elevated system. The original station contained three 2700-kw, direct-current, vertical, cross-compound units and 6000 hp of Babcock & Wilcox boilers. The extension for the two new units is carried on a heavy concrete foundation supported on piles. The superstructure frame is of very heavy steel, particularly in the boiler room, where it is designed to carry boilers, economizers and an overhead bunker of 3000 tons capacity, or 33 tons per linear foot. Both the foundations and superstructure were designed by the constructing engineers, the architectural features being worked out by the architectural department of the Boston Elevated Company.

The new boiler room equipment consists of eight 600-hp Babcock & Wilcox boilers, with boiler suspensions attached directly to the building columns. The superheaters



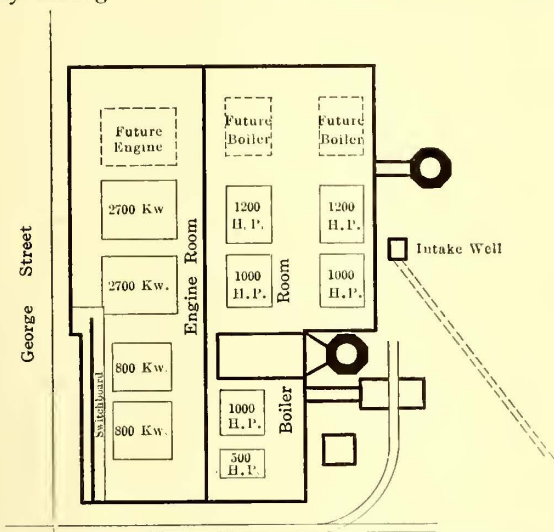
Power Station Improvements in Boston—Plan of Reconstructed Lincoln Wharf Station

other year increase to more than 10,000 kw. It was therefore decided to install without delay 10,800 kw of direct-current generating machinery, with the necessary boilers, while an ultimate decision on recommendations for a plan of broad permanent power development was pending. On Jan. 18, 1907, definite arrangements were made for the work of construction.

have such area that they will give 50 deg. superheat at normal boiler output, and not more than 75 deg. at 50 per cent normal output. Roney mechanical stokers, each having an effective grate area of 111 sq. ft., exclusive of the dead plates and one-half the dumping grates, are provided throughout. The grates proper are of the sectional-fin type. The boiler feed-water equipment consists of four

Warren outside, center-packed pumps in the basement under the boilers, any three of the pumps being of sufficient capacity to supply all the boilers when running at 50 per cent overload.

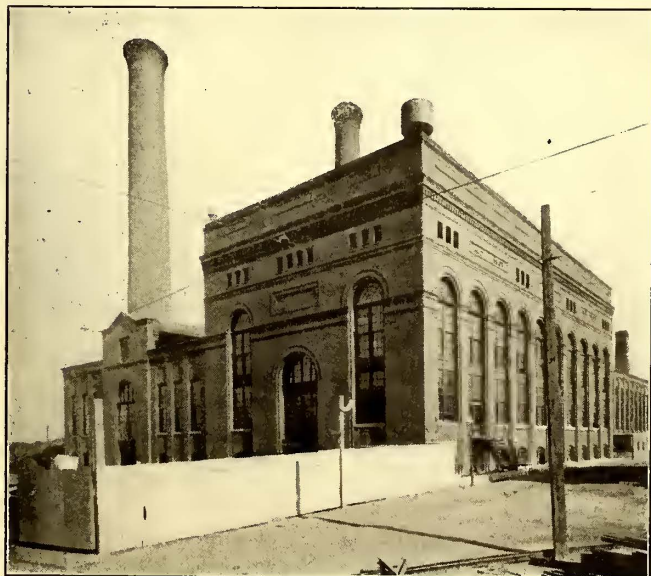
The feed water passes successively through primary heaters between the engines and condensers, through open heaters fed by exhaust steam from the auxiliaries and finally through the economizers. These economizers are



*Electric Ry. Journal*

**Power Station Improvements in Boston—Plan of Reconstructed Charlestown Station**

of the B. F. Sturtevant heavy pattern, tested to 400-lb. cold-water pressure. The primary heaters between the engines and condensers are of the horizontal, closed type, and are designed to raise the feed water from 40 deg. Fahr. to within 5 deg. of the temperature of the exhaust steam. The open heater is of the Cochrane horizontal, cylindrical type, with cast-iron trays, and raises the temperature of



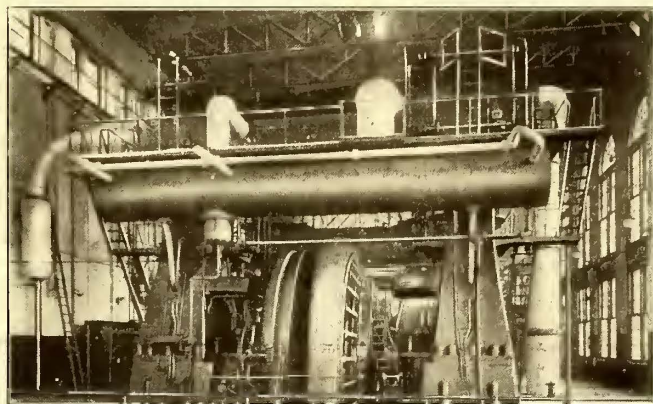
**Power Station Improvements in Boston—Exterior of Charlestown Station**

the feed water to within 3 deg. of the temperature of the exhaust from the auxiliaries. The economizers deliver the water to the boilers at a final temperature of about 250 deg. Fahr.

Squire's automatic feed-water regulators have been supplied in all the stations, on old boilers as well as new. This device controls the feed valve through pressure ex-

erted on a diaphragm which tends to close the valve when the water in the boiler rises above a predetermined level. A pilot valve actuated by the expansion of a metal harp located in the side of the boiler regulates the pressure on the diaphragm. The harp is placed at the proper height in respect to the water level to give the maximum expansion or contraction for any change in the height of the water. The action of this automatic device is safeguarded by a water-column alarm which will attract the fireman's attention and enable him to regulate the water supply by a hand-operated valve in case of disarrangement of the automatic feed.

The new engines are of the heavy rolling-mill type, with a large factor of safety, and were built by the William Tod Company. When running at the designed initial steam pressure of 180 lb. per square inch, they have a sustained overload capacity of 50 per cent, with decrease in normal speed not exceeding 2 per cent. Each engine has a special barring arrangement consisting of a circular rack inside the rim of the flywheel and a pinion driven by a 30-hp electric motor. Jet condensers, built by the Warren Steam Pump Company, are used in connection with vertical direct-acting twin air pumps. The steam cylinders of these air pumps are 16 in. and the air cylin-



**Power Station Improvements in Boston—Interpole Generator in Charlestown Station**

ders 48 in. in diameter, with a common stroke of 24 in. These condensers were at the time of installation the largest of the type that had been turned out by the manufacturers.

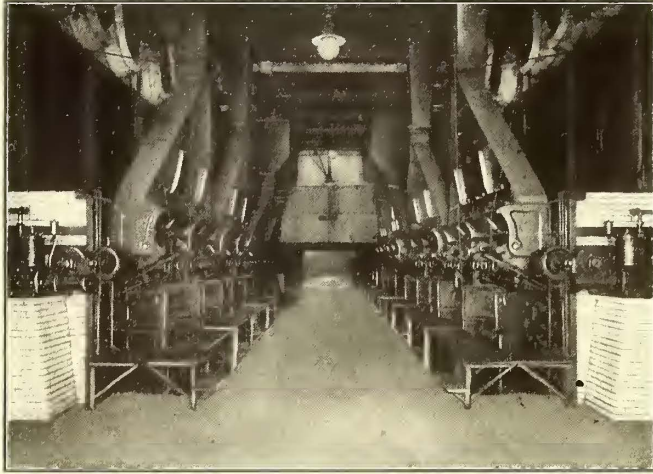
The generators are of the direct-current railway type, and were built by the Allis-Chalmers Company. The winding is compound and designed so that by the adjustment of a shunt on the series field they will operate at any characteristic between an approximate rise of 10 per cent and an approximate fall of 10 per cent at the full-load potential of 575 volts. The falling characteristic was required to provide for proper distribution of load among the company's various stations. Commercial efficiencies guaranteed by the makers ranged from 89 per cent at one-quarter load to 94.8 per cent at full load, decreasing to 94 per cent at 50 per cent overload. The switchboards and electrical distributing system have no particularly novel features. However, a part of the reconstruction consisted in moving the switchboard proper from the level of the engine-room floor to a gallery extending the entire length of the engine room.

In the general work of reconstruction of the Lincoln station one of the most difficult features was a new tunnel for the supply of condensing water. Previously the plant had been supplied through a suction main, but the enlarged station required a gravity intake and limited space made

tunneling necessary. The tunnel is 6 ft. in diameter and 210 ft. long, lying 19 ft. below mean high water. It was driven without the use of a shield in 56 working days and without accident. The workmen were safeguarded from danger of cave-in by steel roof plates.

**CHARLESTOWN STATION**

The Charlestown station furnishes electricity for all the lines operating in Charlestown, Somerville, Everett and

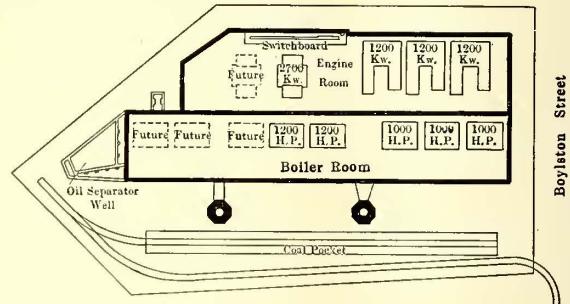


**Power Station Improvements in Boston—Boiler Room of Charlestown Station**

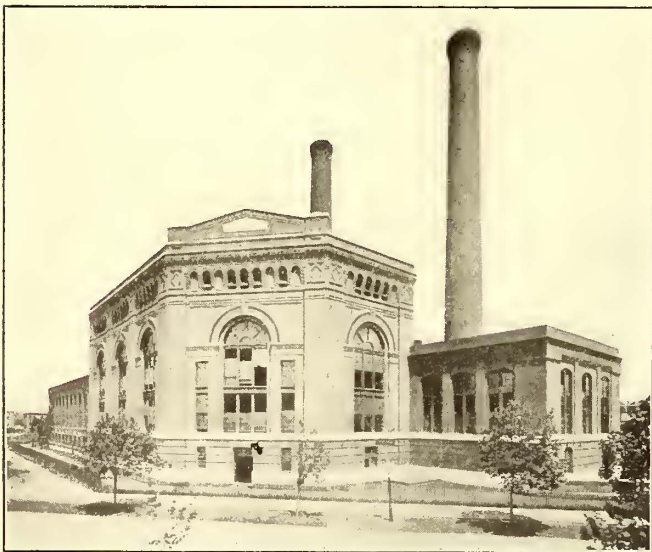
Chelsea. The old station contained 1200 hp of engines, boilers and auxiliaries in a small structure, and one 2700-kw unit, with boilers, in a modern extension of the original structure, making practically 4000 kw in all. The recent work consisted in the enlargement of this newer portion to accommodate the new unit and to provide space for a future machine of the same capacity. It included also the construction of intake and overflow tunnels for the condensing requirements of both the old and new por-

with wide footings resting directly on a bed of hard gravel, except under the new chimney and a portion of the north wall, where, on account of an underlying stratum of silt, it was necessary to drive piles. The superstructure is of steel frame and brick construction, with a longitudinal brick wall dividing the engine room from the boiler room. The new boiler room will accommodate eight 600-hp Babcock & Wilcox boilers, though but four such boilers are included in the present installation. The new chimney and flues are of sufficient area for eight boilers. The boilers were built according to exceptionally rigid specifications, no cast iron or semi-steel being permitted in any part of the work. They were erected entirely independent of the building structure. In front they are carried on building columns and in the rear by the standard Babcock & Wilcox type of suspension.

Superheaters are included and are of the same type and heating capacity as those installed in the Lincoln Wharf station. The new stoker equipment also is similar to that in the Lincoln Wharf station. The overhead bunker capacity is 600 tons, or 75 tons per boiler. This is three days' supply, or enough to carry over holiday periods or periods when it is necessary to make repairs on coal-handling or conveying apparatus. The conveying apparatus consists of an inclined bucket conveyor from a hopper out-



**Power Station Improvements in Boston—Plan of Reconstructed Harvard Station**



**Power Station Improvements in Boston—Exterior of Harvard Station**

tions of the plant. The original suction intake and overflow pipes were so deteriorated as to require replacing in any event, so they were entirely removed and a new gravity system was installed. The intake and discharge tunnels are about 800 ft. long and 4 ft. in diameter, leading to the Mystic River.

In the new building the foundations are of concrete,

side the building to the top of the boiler room and a horizontal fly conveyor to the several bunkers.

Economizers were not installed, because that would have entailed increasing the area of the boiler room and the saving effected by them would not have justified the extra expense. To heat the feed water both a primary heater between engine and condenser and a Cochrane open heater are installed. The primary heater raises the temperature of the water to within 5 deg. of the temperature of the exhaust steam from the engine. The open heaters then increase the temperature of the feed water to about 210 deg. Fahr. before it enters the feed pumps.

The new engine is of the vertical cross-compound type and was built by McIntosh, Seymour & Company. The normal rated capacity at 190 r.p.m. and 160-lb. steam pressure at the throttle is 4100 hp, the maximum capacity being 7000 hp. With a superheat of 50 deg. the guaranteed steam consumption varies from 12.75 lb. at one-quarter load to 12.5 lb. at full load, increasing to 13.85 lb. at 50 per cent overload. The valve gear is the standard type of the makers, the main steam and exhaust valves being driven by fixed eccentrics, while the steam cut-off is effected by a riding valve controlled by a shaft governor. All valves are of the gridiron type. The condensing apparatus is similar to that in the Lincoln Wharf station.

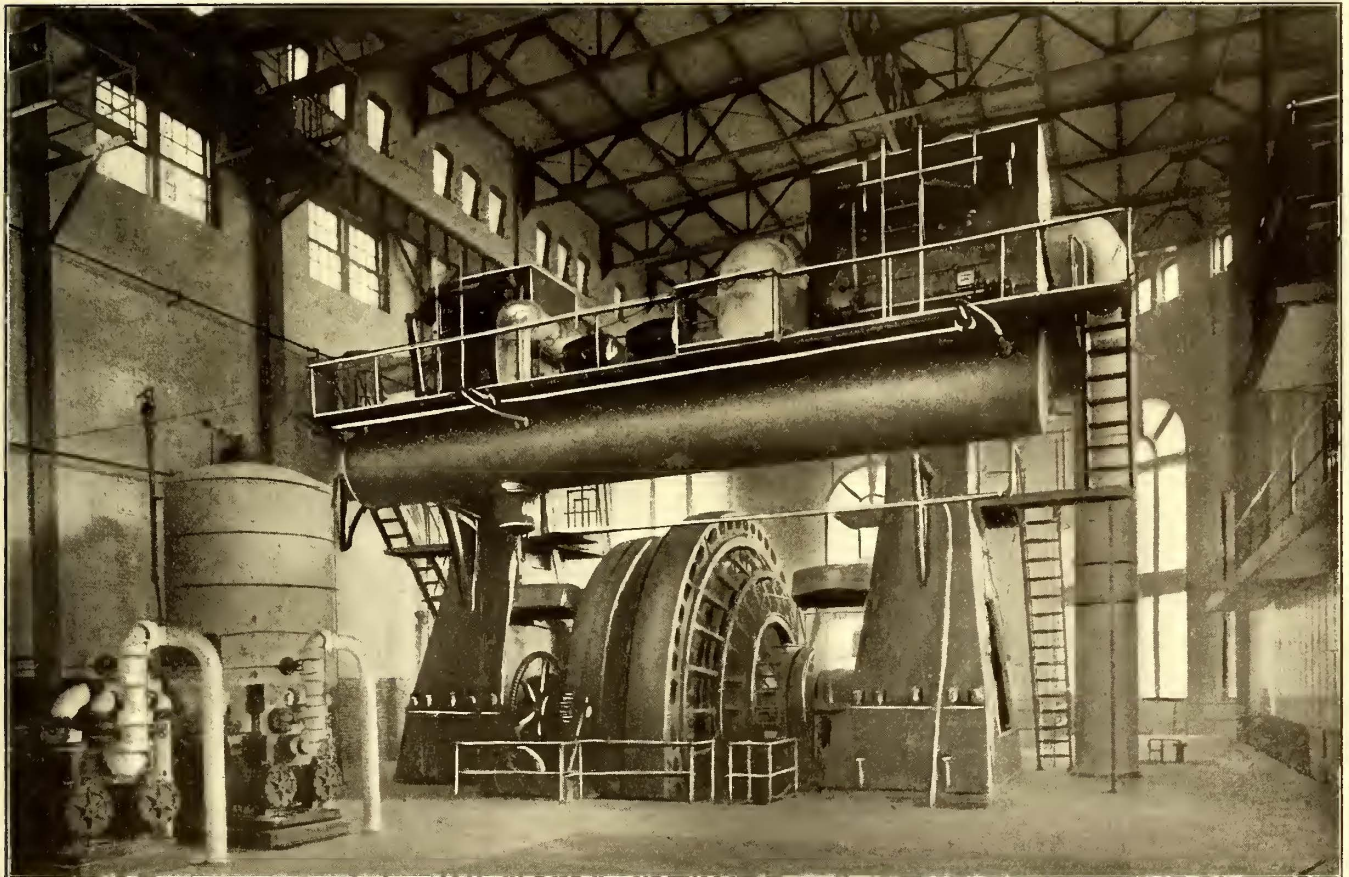
The new generator in this plant is of the General Electric 600-volt railway type. It is built with commutating

interpoles and was one of the first large generators thus equipped. In this case the operation has been most effective. Sudden and extreme changes of load can be effected without shifting of the brushes, and, even when running at a 50 per cent overload, the circuit-breaker may be tripped without sparking at the brushes. At the same time the generator has run satisfactorily in parallel with the other generators of standard non-interpole type. The guaranteed commercial efficiency of this interpole generator varies from 94 per cent at one-half load to 95½ per cent anywhere in the range from full load to 50 per cent overload.

Aside from the actual extension, a great deal of reconstruction was carried out in the old plant, with a view of increasing efficiency and reducing fire risk. New stokers were placed under four of the old boilers. Old motor-driven feed pumps were replaced by duplex steam pumps. The

The new extension fronts on the Charles River Boulevard, and its pleasing façade practically effaces the older portion.

In building this station unusual measures were adopted to secure stable foundations. The ground is of a swampy nature, and in the old station the horizontal engines caused marked oscillations of the structure, especially when two or more of them were running in unison. To obviate this weakness a plan was used in the new structure which practically made a monolith of the entire foundation bed. The whole foundation area was first enclosed in a cofferdam of heavy yellow pine sheet piling driven to a depth of 30 ft. below grade. Piles were then driven within this area until it was literally packed solid. Whereas the first piles driven sank into the silt almost 20 ft. under the mere weight of the hammer, the piles last driven finally encountered such friction that the travel was only about



Power Station Improvements in Boston—Engine Room of Harvard Station

pipng system was changed over, and a Bulkley condenser was replaced by a twin vertical air pump and jet condenser, the same type as the condenser installed with the new engine. The switchboard was relocated in a steel and concrete gallery. A fireproof floor was built in the engine room, replacing a wooden floor, and various changes were made in the oil filtering and distributing system.

#### HARVARD STATION

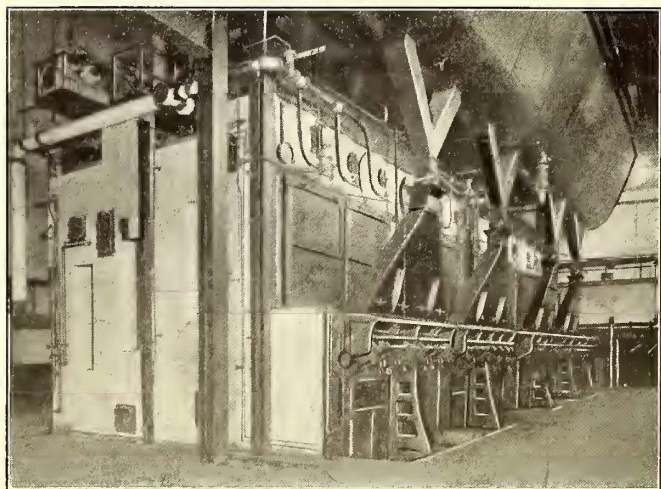
Located on the new Charles River Boulevard, near Harvard Square, this station serves Cambridge, as well as the rapidly growing districts to the north and west. In this station more than in either of the others has a revolution been worked in the external appearance. Architecturally, it has been very carefully designed so as to conform to a park-like environment. The old structure was a plain brick building containing 3600 hp of engines and boilers.

1 ft. under the blow of a 2000-lb. hammer. This elaborate sub-base was completed and the concrete foundation laid upon it ready for the steel within two months from the time ground was broken.

The old and new portions of the foundations were bonded together by means of steel beams and rods buried in the concrete and the steadying effect of the new sub-base is transmitted to the old foundations through this bond. While the remote end of the old building still vibrates, the motion gradually diminishes to the point of junction with the new structure, beyond which point there is no perceptible movement.

Severe restrictions were encountered by the engineers in planning the discharge water system. The Park Commission of the city of Cambridge had permitted the building of the plant on the chosen site only upon the agree-

ment of the Boston Elevated Company to prevent the oil in the condensing water from finding its way into the Charles River. Filtration was not practicable, owing to lack of room for filters large enough to handle the 800,000 gal. of water discharged per hour at peak load. The labor required to keep such filters in order presented another objection. The device finally decided upon was virtually a large separator. The discharge water flows slowly through



Power Station Improvements in Boston—Boiler Room of Harvard Station

a concrete pit of large area. The oil rises to the surface before the end of the pit is reached and is held by means of baffle boards until it can be drawn off into the oil pit. The oil pit is formed at one side of the separator by an adjustable weir. In practice it has been found that this weir can be adjusted so the flow over at its top at peak load will be just sufficient to remove the oil which has accumulated at lighter loads, thus making the separation process nearly automatic. The slight amount of water which comes over into the oil pit is drawn off by means of a drain connected to the city sewer. There has been no trouble from oil getting into the river. In this station the equipment does not differ in any noteworthy particular from that installed in the Charlestown station, and detailed description is unnecessary.

### THE CONNECTICUT REPORT

The report of the Connecticut Board of Railroad Commissioners, containing the reports and statistics of the electric railway companies in that State for the year ended June 30, 1908, has just been submitted to the Legislature. It shows that the New York, New Haven & Hartford Railroad controls 718.859 miles of the 895.037 miles of electric railway tracks reporting to the commission. Of the total 18,384 miles are in New York State.

Some of the more important statistics follow:

	1907-08	Increase
Gross earnings .....	\$7,318,240	\$504,554
Operating expenses .....	4,769,989	248,916
Net earnings .....	2,548,251	255,637
Car mileage .....	29,024,838	1,334,725
Passengers carried .....	138,530,816	10,829,391

The gross earnings per mile of track were \$8,191.03; per car mile, \$0.2521; per car hour, \$2.339. The operating expenses per mile of track were \$5,338.87; per car mile, \$0.1643; per car hour, \$1.524. The number of persons injured was 1,565, including 38 killed.

### ACCIDENT INSTRUCTION IN PHILADELPHIA

A series of five articles on the "Problem of Reducing Accident Damages," by Frederick W. Johnson, assistant general claim agent of the Philadelphia Rapid Transit Company, was concluded in the issue of the *ELECTRIC RAILWAY JOURNAL* for Feb. 6. These articles described the methods of instructing trainmen in the prevention of accidents and in the proper handling of accident cases as practised by the Philadelphia Rapid Transit Company. As a result of an experience extending over nearly a year with this system of instruction the company has decided to extend the system and to put into effect a number of new features. Mr. Johnson will devote a large part of his time to instruction work among trainmen, and an outline of his future plans may be summarized as follows:

The first task is necessarily that of devising ways and means for holding whatever advantage the company has been able to gain up to the present time. The present practice of giving two series of lectures per year, one in the late spring and the other during the fall, will be continued, and in addition there will be inaugurated the practice of holding special classes in addition to the regular classes between these two series of lectures. These special classes will be held from time to time at individual operating depots whenever the men show the need of other instruction along specific lines. The company has not been able heretofore to develop in this direction on account of the inability of those in charge of the instruction work to devote the time necessary for this purpose. An operating depot will be deemed in need of special class instruction if it is reported for developing a weakness in the matter of obtaining witnesses or failure to promptly report all accidents or because of an excessive number of collisions of cars or other classes of accidents.

The school of instruction in accident work at headquarters, which all new employees are required to attend, will be revised in several essential respects. Printed matter, to be placed in the hands of new employees to still further impress upon their minds the importance of the oral instruction which is given them in these classes, will be prepared. This material will be written with a great deal of care, and it is believed that considerable good will accrue from its use.

The company intends also still further to impress upon the minds of its division superintendents the necessity of sending to the headquarters school all experienced conductors or motormen who demonstrate a need of additional instruction. In the event of a conductor or motorman falling short of the required standard without any reasonable explanation, he will be adjudged a proper candidate for further instruction at headquarters. In time, it is thought that these requirements will assist materially in strengthening certain defects which up to the present time have proved to be obstacles to the development of the company's accident work.

Changes, innovations and new ideas must be introduced from time to time in order that the interest of the trainmen may be retained in work of this character. With this idea in mind, the style and form of the present weekly accident bulletins will be changed somewhat, making them a little more complete in detail and more attractive in appearance. The company is also considering the advisability of issuing these bulletins every second payday instead of weekly, as at present.

In order to keep in the closest possible touch with the local situation at each of the company's operating shops,



Mr. Johnson will set aside one day of each week for the purpose of personally calling on each of the depots, thus taking advantage of all suggestions which may be advanced by superintendents or others. It is believed that by these means it will be possible still further to interest the division superintendents in the work of reducing accident damages, and many valuable ideas also will doubtless be picked up during the course of these visits.

The company intends to keep an even more accurate record of statistics of every character concerning the nature, number and location of various types of accidents with a view of guiding its efforts in the future along lines likely to prove productive of the greatest good. An effort will be made to study conditions on other large city systems, with a view of finding other improvements which could be adopted to advantage by the company in Philadelphia.

The efforts of the company so far have been confined

## GROUT MIXING MACHINE OF THE UNITED RAILWAYS OF ST. LOUIS

The accompanying illustration shows a grout mixing machine designed and built by the United Railways Company of St. Louis. This mixer has been found to be of considerable value as a labor saver when track is being constructed in paved streets. The equipment comprises an old mail car from which one-half of the body has been removed, leaving an open platform on which the motor-driven mixer is mounted. The remaining half of the body serves as a storage room for cement and tools. The mixer proper comprises a tank in which are agitating paddles carried on a horizontal shaft driven by a GE-800 motor with standard railway gearing. The paddles within the mixing tank were originally designed for a Drake concrete mixer, but have been reset so they act against one another and do not tend to move the mixture from one end to the



Grout Mixing Machine Built by the United Railways of St. Louis

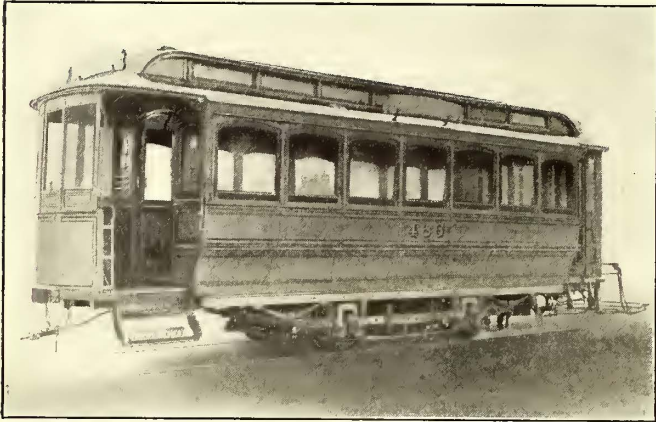
solely to instructional work among its trainmen. A very large field is open in bringing the importance of the subject of accident damages before the general public in such a way as to enlist their hearty co-operation. It is believed that in time the company will be enabled to enlist the support of a portion, at least, of the traveling public and a very large number of the business houses, which have many teams upon public streets, in a general movement to prevent accidents. If placed before them in the proper light the subject can be made to appeal to them as being one of mutual interest. It has also been suggested that the subject might be placed to advantage in some way before the thousands of children in the public schools for the purpose of inculcating caution in their minds. In a city the size of Philadelphia the number of children who are injured in one way or another by street cars in the course of the year constitutes a problem well worthy of careful study.

other, but only to keep it thoroughly stirred up inside of the mixing tank.

When it is necessary to use grout in constructing pavement the mixer is run to a pile of sand and the desired amount placed in the mixing tank; then as the car is moved along the street, cement is added and the paddles are revolved during the journey. When the place is reached where the grout is to be used water is thrown into the tank by means of a hose and the moving paddles quickly complete the mixture. The paddles are kept running all the time while the mixture is in the tank so that the sand will not settle, and thus a thorough mixture is assured. The grout after having been mixed is discharged through either of the two spouts shown and in this way can be placed directly on the street where desired. But little work is required to sweep the mixture into the joints of granite pavement or to spread it for a foundation on which paving blocks may be laid.

## REBUILDING MONTREAL SINGLE-TRUCK CARS FOR PAY-AS-YOU-ENTER SERVICE

Since the first pay-as-you-enter cars with long platforms were built at Montreal experience has shown that a platform of the extreme length originally used is not necessary for the success of the pay-as-you-enter system of fare collection. Accordingly, the platforms of the cars



Montreal Single-Truck Car Before Remodeling for Pay-As-You-Enter Service

built recently at the Hochelaga shops of the Montreal Street Railway Company have been shorter; yet the latest type of cars has been found to maintain schedules with equal efficiency as compared with the early cars having 9-ft. platforms and has in every way been as satisfactory.



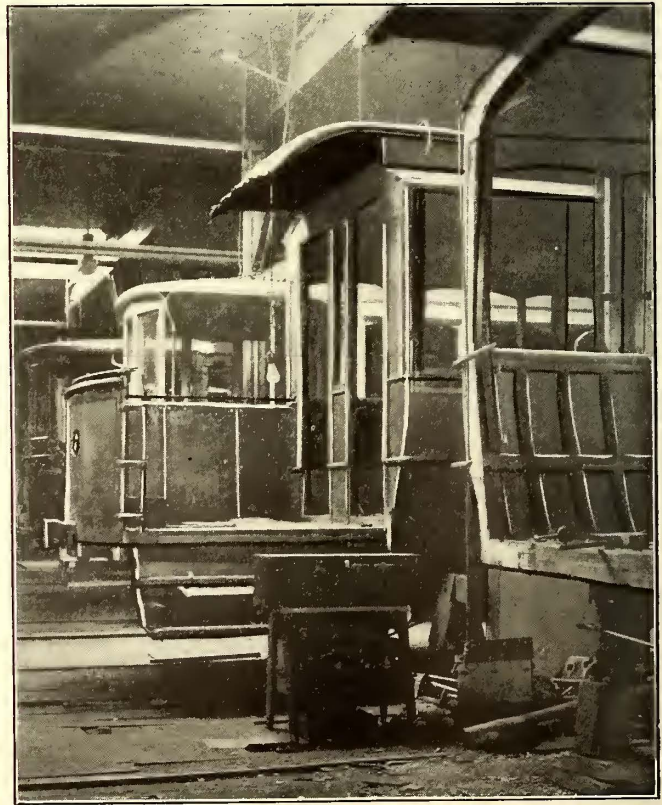
Construction Views of Montreal Single-Truck Cars in

view of these circumstances it was recently decided to shop some single-truck cars, of which there were a number in service, for a thorough overhauling, and provide them with pay-as-you-enter platforms. The cars as originally built by the Montreal Street Railway were

single-enders, 20 ft. 6 in. long over the end panels, 7 ft. 6 in. wide over the sills and had platforms 3 ft. 10½ in. long at both ends. The front platform was full vestibuled, with a 20-in. folding door on one side, which was designed exclusively for the motorman's use, and the rear platform was vestibuled except at the step. In reconstructing the cars for pay-as-you-enter operation a two-panel telescoping door was substituted for the folding door at the front platform. By this change in the door, which, with an alteration in the position of the brake staff, was the only one required for the front platform, an exit 23 in. wide was secured. The rear platform was lengthened from 3 ft. 10½ in. to 5 ft. 6 in. and the rear bulkhead provided with the door arrangement characteristics of all pay-as-you-enter cars.

In undertaking the work on the rear platform much of the old material was found to be in first-class condition, in spite of the fact that the cars had been in service for over 10 years. The entire vestibuling was used, with the addition of a 20-in. panel on the side. The platform hood was lengthened 20 in. and recovered with new canvas, split joints being employed in the woodwork to make a thoroughly finished and substantial job. For the platform framing new side knees were employed, and these were plated with ¼-in. steel on both sides. The center timbers were spliced and a new crownpiece and new flooring employed.

Though the width of the car body was very limited, the rear bulkhead doors were very satisfactorily arranged. The swinging door used for entrance was made 23 in.

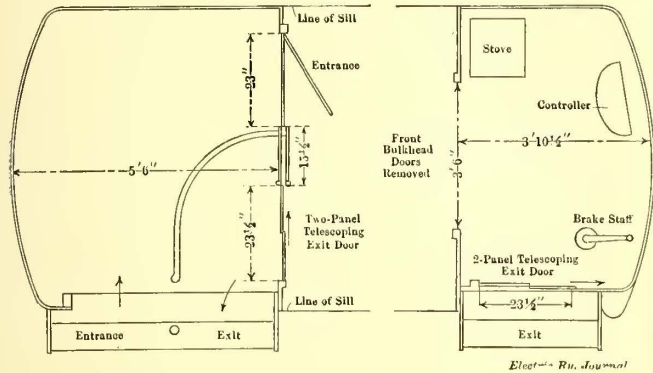


Shops, Showing Method of Lengthening Rear Platforms

wide and an exit 23½ in. wide was secured by employing a two-panel telescoping door of the same dimensions as that used for the front platform. These doorways have been found amply wide for expeditious movement.

Aside from the lengthening of the rear platforms, the

cars were entirely overhauled. The work included the insertion of 10½-in. truss planks over the side sills, the reupholstering of the seats, the cleaning and revarnishing of all interior woodwork and the installation of a push-button circuit. The exteriors of the cars were repainted and car numbers lettered on the front dasher in large aluminum figures on a red background, so as to be readily discernible



Plan of Montreal Single-Truck Car Platforms, Remodeled for Pay-As-You-Enter Service

from a distance. This is the method used by the Montreal Street Railway to designate all of its pay-as-you-enter cars.

Thus far 20 of the single-truck cars with 5-ft. 6-in. pay-as-you-enter platforms have been placed in service, and their success has been so marked that the management has decided to rebuild all of the single-truck cars now in service for pay-as-you-enter operation as rapidly as they can be withdrawn and shopped without curtailing the equipment required for daily service. They are the

as-you-enter cars with long platforms. The usual increase in receipts and reduction in accidents has also been noticeable. The cars are very economical to operate because of their light weight, which totals only 20,700 lb., the weight of the body being 9700 lb., the truck weighing 6600 lb. and the motors and electrical equipment 4400 lb.



Montreal Single-Truck Car as Rebuilt for Pay-As-You-Enter Service

The work of rebuilding the cars was done by the mechanical department of the Montreal Street Railway Company in the Hochelaga shops under the supervision of the Pay-as-you-enter Car Corporation.

### MASSACHUSETTS STREET RAILWAY ASSOCIATION

The regular meeting of the Massachusetts Street Railway Association was held at Young's Hotel, Boston, on the evening of Feb. 10. The address of the occasion was given by John R. Graham, president of the Bangor Railway & Electric Company, on "The Electrification of a Part of the State of Maine." Mr. Graham described the recently completed hydro-electric plant of the Bar Harbor & Union River Power Company at Ellsworth, Maine, which supplies power to Bangor as well as to Bar Harbor, and which is under the control of the Bangor railway and electric interests. The methods of construction in the plant were described, and the speaker then devoted some time to a review of the water-powers now under operation in central Maine, and the utilization of those of the Penobscot and Kennebec rivers for electrical purposes.

Reference was made to the new Lewiston, Augusta & Waterville Street Railway, whose headquarters are at Lewiston, and which is made up of several local companies centering in and about Lewiston and Augusta, with lines reaching Mechanic Falls, Brunswick, Bath, Turner, Sabattus, Togus, Winthrop, Gardiner, Hallowell and Winslow. About 60 miles of new road have been built within the last two years. The whole company is now operated as one system of about 140 miles of track. There are 113 passenger cars. The longest route is between Lewiston, Augusta and Waterville, the distance being 50 miles total and the running time three hours. The roadbed is substantial, and the track is built of 70-lb T-rails with Weber joints. Twin terminal bonds are used the entire length of the road. The company uses a double trolley wire installation. It is possible to travel from Bath to Waterville, 80 miles, with only one change of cars. The freight possibilities are attractive and will be developed as soon as feasible. The company has leased a large block in Lewiston for its general offices at a central point, where 600 cars pass within an 18-hour day. It is now possible to travel by trolley from Boston to Waterville, Maine.



Rear Platform of Rebuilt Montreal Single-Truck Car

first single-truck cars of this type thus far placed in operation either in the United States or Canada. When the first cars were rebuilt it was anticipated that the 5-ft. 6-in. platforms might be too short to handle to advantage a large number of passengers at a time, but no difficulty has been experienced whatever and the cars have been able to maintain the same schedule as the large double-truck pay-

## THE NEW YORK PUBLIC SERVICE COMMISSIONS\*

BY THOMAS M. OSBORNE, MEMBER OF COMMISSION OF THE SECOND DISTRICT

In New York State we have lately been bothered by a new political catch-word—"government by commission." During the recent State campaign one could hear on all sides, "Yes, I admit this or that; but I am opposed to government by commission;" and one of the ablest and most perverse of our metropolitan newspapers announced itself as being in favor of "the summary arrest and, so far as practical, the abolition of government by commission, whereof the portentous growth in State and nation constitutes one of the greatest dangers of the times, and whereof the extreme of futility has been illustrated in Governor Hughes' principal creature"—the "creature" referred to being the Public Service Commission, of which I have the honor to be a member.

The truth is, there are many forms of government by commission, and some are good and some are bad. The Supreme Court of the United States is a commission to hear and determine final appeals and decide, if it can, upon the meaning of the constitution; the Interstate Commerce Commission is a body which, violently opposed at its inception, has become a necessary means of controlling our great interstate railway corporations. There are various commissions in the several States which cover a variety of activities—railroad, gas, electricity, prison and highway commissions; our boards of education are commissions specially charged with the interests of the schools; there are in most cities commissions for the police, fire, charities and other municipal departments. All these are examples of "government by commission;" and there are many others.

### MUNICIPAL COMMISSIONS INADEQUATE

Speaking personally, and after some experience with municipal commissions, it has occurred to me that in general the difference between a commission that is worth while and one the usefulness of which may be questioned, depends, perhaps, on the fact whether their duties are judicial or administrative. I believe that most municipal commissions are very inadequate means of getting at results. I refer to the police and fire commissions, or the commission of public works in a city the size of that in which I was once a part of the administrative government. [Mr. Osborne was formerly Mayor of Auburn, N. Y.—Eds.] I found in my own experience that a commission of three to manage the fire department was by no means as efficient as a single individual. One does not have to go behind one's business experience to understand the reason for that. An individual who has an office to administer, who has certain work to perform, takes pride in having that work done well, because its well-doing reflects credit upon him personally; and you could not possibly conduct a great manufacturing business by having a commission to undertake the work of the superintending officer. You could not have a commission to manage each department as a foreman manages it; and the best results are obtained when you focus the responsibility upon single individuals, making them again responsible to the head of the concern. And so far as the city I have referred to, Auburn, is concerned, we made extensive changes in our charter, by which we abolished the old city commissions and substituted individuals appointed by the mayor and removable by him, and the results have been far better for the city.

How absurd those city commissions often are I have found in my course of travels through New York State. I struck one small municipality that had an elaborate police commission of three. I asked how many men there were on the force, and was told there were four. In another city I went to there was a commission of four on the board of public works, and with the common notion that bipartisanship is nonpartisanship, it was called a nonpartisan commission, two of the commissioners being Republican and two Democratic; and in order to be fair, the Republican party having two wings, one was appointed from one wing and the other from the other; ditto with the Demo-

crats. So that you had two Democrats fighting between themselves and two Republicans fighting between themselves; and whenever any party issue came up you had the Democrats against the Republicans. At the time I speak of the whole street department had been held up for several months, and the city was rent in twain over the immensely important question as to the appointment of an additional street sweeper.

I am opposed to such municipal commissions. We have in New York State various State commissions—some of them appointed because our State officers have not been the efficient officers that they should be. According to our present system of election of minor State officials, when it comes to nominating them in State conventions they are parcelled out to the different local bosses in different parts of the State. The result is just what one would expect. I have never met anybody in New York State who could remember the name of one of these State officials, with some few honorable exceptions, five years after he retired from office; and some of them have been so useless and the departments have been run so badly that the Legislature has in its wisdom decided to appoint a commission to do the work of the State official.

### RELATIONS OF CORPORATIONS TO PUBLIC AND STATE

Among the commissions that have seemed to me wise and calculated to work for the public benefit are the public service commissions of New York State. It has been very well understood for some years past that the problem of the relations of our great public service corporations to the public on one side and the State on the other formed a very serious problem—if not the most serious problem which faced us. It has not been quite so well understood, at least among us in New York, that there were only three possible solutions of that problem—only three possible ways in which we could move forward.

(1) We could let things alone, to drift as they may and settle themselves if they will;

(2) We could adopt State ownership; or

(3) Have some form of State regulation and control.

When you come to analyze the question there are no other possible courses.

(1) We have tried letting things alone in the past, and it has resulted in an intolerable condition of things. Offensive monopoly on the part of corporations; swindling by irresponsible and unscrupulous promoters; financial loss of innocent investors; blackmail by corrupt legislators and politicians and practical robbery and continuing robbery of an outraged public for the benefit of the swindlers and blackmailers—these have been the too frequent results of the "let alone" policy. And such things do not "settle themselves" with justice to the public or the State, for there are certain evils which creep in, which cannot be remedied without great suffering.

(2) State ownership is a remedy which is believed in by many excellent and thoughtful men; but a majority of such are not yet convinced of its desirability—at least not until they have tried another method. State ownership has two obvious and great disadvantages. First, it would require an enormous investment of public funds for utilities which are already provided for the public service by private capital; and second, it would require a large force of public servants of a kind our democracy has not yet learned to manage in a businesslike way, or even in any considerable number to produce.

(3) By State regulation and control we can secure all the advantages of public ownership without its disadvantages. Leaving the financial ownership and management of the public utilities in the hands of private persons, but forcing those persons to recognize their obligations toward the public and the State (because their investment rests upon a practical monopoly granted by the State), we can enforce justice to all three parties in interest—make the investments more stable and conservative, while securing to the public its rights and at the same time guarding the future interests of the State.

### CHANGE IN RELATIONS

There has been such a change within a generation or two in the whole social structure, in social conditions, that we very often fail to recognize the alteration in the relations between these great public service corporations and

\*Abstract of address read before the Annual Meeting of the National Municipal League, Pittsburgh, Pa., on Nov. 19, 1908.

the public and the State. It was evidently anticipated that the railroad would be in the nature of a highway upon which the people might run their own private carriages, just as they ran their own private carriages upon the turnpike. In other words, in the beginning the railroad was a competitor of the turnpike and the canal. It was not in any sense a monopoly; it was a competitor—a new form of competitor to an existing system.

All this brings before us forcibly the great difference in the manner of looking at these public service corporations. When we examine into the other utilities subject to the New York Public Service Commissions Law, besides the railroads, we find the same interesting facts, which we are so apt to forget. When trolleys came into use they formed a new sort of competition against the more expensive cab companies. The interurban trolleys were competitors of the railroads. When gas came into use it was only a new-fangled light offering itself in competition with candles and lamps. Electric light, when it appeared in its turn, was a competitor of gas. Now, beginning as a new form of competition, these public utilities rapidly, many of them (less rapidly, of course, in the case of the railroads), became a public convenience, and from a public convenience they became a public necessity, because the social structure grew up around them and made such use of them that it became absolutely dependent upon them; and after they became an absolute public necessity, and in the case of railroads, where not only the commercial prosperity, but even the very lives of large communities depended upon them, then these public utilities became practical monopolies; for wherever a public utility has a community in its grasp it becomes a monopoly. We have hesitated to recognize them as such, and have tried to regulate them by competition. We have chartered rival railroads. We have chartered rival gas companies and electric companies. But free and open competition is not possible in these public utilities, and we are forced back to the plain proposition that they are monopolies, and must be regulated as such. That being conceded, we are justified in demanding State regulation; and there is no form of State regulation that has yet been devised that is as good and efficient as a commission, such as that in Wisconsin has turned out to be, and such as we hope these in New York are turning out to be.

I would say that we have not the excellent provision of the Wisconsin law—the provision forbidding discrimination in rates which is in the railroad section of our law, but does not exist in the lighting section of the law. It was presumably overlooked because of the law being somewhat hastily drafted. It is an extraordinarily successful law, considering how rapid was its preparation. The lighting act passed the year before, the gas and electricity act, was put almost bodily into the commissions law, so that many of the points where the old law failed to be effective are also ineffective in our present act.

I think it may also be said that the commissions have been of great service to the public service corporations along the lines Dr. Meyers has mentioned, in making them see very often the poor results of their own management; for in some cases the lack of foresight, the lack of good management is something quite extraordinary.

WHAT THE COMMISSIONS HAVE ACCOMPLISHED

Among the accomplishments of the commission can be said to be these:

1. *The authorization of new corporations.* It has been said that the New York law has absolutely killed the extension of business. In answer it may be said that the up-State commission has authorized 20 new companies in the 15 months from July 1 to October 1; three railroads and 17 gas and electric companies, besides nine extensions of old companies.

2. *It has authorized new capital.* Not long ago it was stated by a gentleman prominently connected with some of the public utilities in New York that no new capital was going into public utilities on account of the passage of the law and the drastic action of the commissions. Our commission has authorized the issue of \$106,000,000 of new securities within the 15 months, and that means honest capitalization. In face of the hard times which the country has been passing through, that is not so bad.

3. *Abolition of railroad rate discrimination.*
4. *Abolition of rebates.* There can be no real uniformity of rate if rebates are permitted. By a uniform system of accounts rebates can now be detected, and it is believed that the practice has been effectually stopped.
5. *Improvement in freight service.*
6. *Reduction of rates.*
7. *Improvement in passenger service.* I think the proportion of trains on time has increased from 60 per cent to about 80 per cent. There is still room for improvement.
8. *Trains taken off have been restored.*
9. *Stops have been ordered for the convenience of various localities.*
10. *Repayment of excessive or illegal charges.*
11. *Elimination of grade crossings.* The advent of the motor has made this subject one of increasing importance. The commission has moved in this matter as fast as the appropriations made by Legislature will allow, and many dangerous crossings are being replaced by new and safe crossings.
12. *The inspection of railroad lines.*
13. *Inspection of trolley railroad lines.* A careful inspection by competent experts of all street and interurban trolley lines, similar to the railroad inspection.
14. *Trolley express companies refused.* The commission has declined to allow the formation of an express company for trolley service. A company became incorporated, with a right to do an express business not only on half a dozen trolley lines centering in Syracuse, which were all more or less owned by the same parties, but all over the United States, and, in fact, it did not stop with the United States. The commission declined to allow the company to do business, holding that it was the proper function of the road itself to take care of its own business, without an intervening corporation to extort additional charges.
15. *Investigation of accidents.*
16. *Inspection by gas companies.*
17. *Inspection of electric companies.* All new electric transmission lines inspected. All meters tested and inspected.
18. *Minor complaints.* A large number of small individual complaints have been remedied, covering a wide and fertile field of possible bad feeling toward the railways.

INDUSTRIAL LOCATIONS OFFERED BY INDIANA UNION TRACTION COMPANY

The timetables of the Indiana Union Traction Company, Anderson, Ind., call attention to the possibilities for industrial location offered by the communities on the lines of the system. The accompanying illustration of an advertisement taken from the timetable for February, 1909, shows the readiness of the company to assist business enterprises seeking locations.

To Those who are Looking for Locations on the I. U. T. System

If you are looking for a location for a business or manufacturing enterprise of whatever nature, on the lines of the Indiana Union Traction Company, we will help you. Hundreds of business men are constantly on the look-out for a change of location for their present business, or are desirous of starting new enterprises. The Time Table Department is constantly in touch with openings for businesses of every character, and our facilities are at your service free of charge.

(Cut this out and mail to Lewis Garrison, Time Table Department, I. U. T. Co., Anderson, Ind.)

I am looking for a location on the I. U. T. System for a.....  
(State business or manufacturing enterprise)  
 and would like to receive information thereon, free of charge.

I am now located at.....in the.....business.

Capital to invest.....My choice of location is.....  
(State amount or trend)

Other information.....  
 Name.....

Advertisement Announcing Industrial Locations on Indiana Union Traction Company's Lines

Advertisement taken from the timetable for February, 1909, shows the readiness of the company to assist business enterprises seeking locations.

In an article in the *American Magazine* for February entitled "Sending a State to College," by Lincoln Steffens, reference is made to the work of Prof. B. H. Meyer, of the Railroad Commission of Wisconsin, as professor of political economy at the University of Wisconsin.

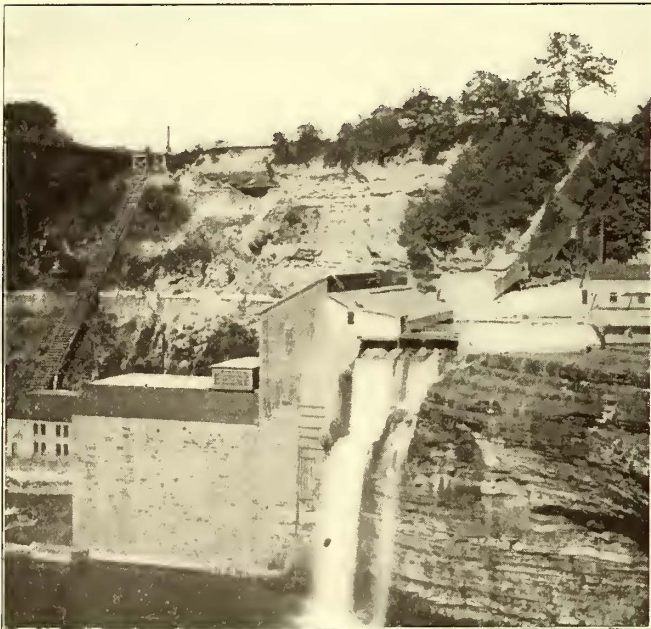
## WATER-POWER AND TRANSFORMER STATIONS OF THE ROCHESTER RAILWAY & LIGHT COMPANY

The *ELECTRIC RAILWAY JOURNAL* of Jan. 23, 1909, contained an article entitled "The Power System of the Rochester Railway & Light Company" which gave a general list of the company's power stations and a detailed description of the Brown's Race plant, known also as Station No. 3. This article will present some details of the important water-power Stations Nos. 5 and 4 and of the new transformer house for Niagara Falls power.

### STATION NO. 5

The largest water-power station of the Rochester Railway & Light Company is known as Station No. 5, and is about 4550-kw capacity. It is on the Lower Falls of the Genesee River, where there is a head of 96 ft. It is 47 ft. x 90 ft. x 47 ft. high, and is built of masonry on concrete founded on the rock at the bottom. This station contains three 2100-hp turbines, two built by the Trump Manufacturing Company and one by the I. P. Morris Company; a 900-hp Morris turbine; a 450-hp Leffel turbine driving a railway generator, and a duplicate driving an alternator.

The electrical equipment installed comprises three 1200-



Rochester Power Plants—Station No. 5, the Most Important Hydro-Electric Installation

kw, three-phase, 4150-volt G. E. generators, each of which is direct-connected to one of the 2100-hp turbines; one 500-kw, 550-volt generator, one 300-kw, 550-volt generator, and one 350-kw, 4150-volt, three-phase generator; the last three machines being of General Electric, Westinghouse and Bullock make, respectively. In addition to the generating equipment there is the following transforming apparatus: nine 71-kw constant-current transformers for alternating-current series circuits and a 500-kw frequency changer. The latter set has a 4150-volt, three-phase, 60-cycle motor and a 11,000-volt, three-phase, 25-cycle generator, and is used for supplying energy to a 40-mile suburban line formerly fed from a steam-driven station located about 6 miles outside the city. Each of the large alternators receives exciting current from a 20-kw multipolar generator fitted to the extreme end of the shaft. The frequency changer has a 25-kw exciter set belted to it, as has also the Bullock set. In addition there is a 50-kw motor-generator set available for boosting railway feeders.

Two high-tension lines carrying energy from Niagara Falls are brought underground to Station No. 5. One of these passes direct from Station No. 6 and the other, also comes from Station No. 6, but reaches Station No. 5 by way of Station No. 1. The 11,000-volt lines radiate from Station No. 5, one line being used to supply energy to Sodus Point, 40 miles away, and the other supplying energy to the railway at Charlotte and vicinity. The Niagara lines are run underground from the Rochester Railway & Light Company's transformer station at Elmwood Avenue to Station No. 6. The transformer station is supplied from the Ontario Power Company's switching station, 4 miles outside the city. All the feed wires from Station No. 5 are carried up the face of the power house next to the falls, where they enter conduits forming part of the race wall and are carried up the high bank, where they enter the underground conduit system.

### STATION NO. 4

Station No. 4 is on the Upper Falls, on the west side of the Genesee River, alongside the tracks of the New York Central Railroad. When water is plentiful this station carries a railway load of about 3000 kw. The head available at Station No. 4 is 94 ft., and the water power developed is 4200 kw. The equipment comprises two twin Leffel turbines rated at 500 hp and belted to four 150-kw, 250-volt Edison bipolar machines; two single Leffel wheels rated at 500 hp, belted to four 150-kw, 250-volt Edison machines; one Poole & Hunt wheel rated at 600 hp, connected by the American system of rope drive to a countershaft, to which are belted two 150-kw, 125-volt Edison machines; one Poole & Hunt wheel belted direct to two 150-kw, 125-volt Edison machines; one 500-hp Leffel turbine belted to two 150-kw, 125-volt Edison machines; one 1200-hp Trump wheel belted to countershaft to which are belted two 150-kw and two 200-kw Edison bipolar machines; one 1200-hp Trump wheel direct-connected to an 800-kw, 250-volt generator feeding the outside wires of the Edison system, and one 1200-hp Allis-Chalmers wheel direct-connected to an 800-kw, 250-volt generator, also feeding into the outside wires of the Edison system. The 250-volt Edison generators are, as occasion demands, thrown in series and connected to the street railway network. To take advantage of the copper distribution available from this station two 500-kw motor-generator sets and one 350-kw motor-generator set are installed. These receive energy from the steam-driven stations and feed into the network focused here. In this way a great saving is effected in the amount of copper necessary to feed this district from the other stations at periods of very low water. The 300-kw motor-generator set is made up of a 350-kw induction motor and two 150-kw, 125-volt compound-wound generators. In the summer it is used principally as a 125-volt or 250-volt booster for the railway feeders, and during the fall and winter it is used chiefly as a plain shunt-wound machine feeding into the Edison system. The machines are capable of taking full load without the series winding. The other motor-generator sets have synchronous motors.

The Edison machines are used chiefly for overloads on water power, and when water is plentiful they carry the load of the steam units, which may then be shut down. When the water is low the company has sufficient other more economical units to carry the load, but since at high water and flood condition the water runs to waste anyway, the Edison machines are brought into use. For peak-load conditions the machines are used about 70 hours a year.

The railway circuits are controlled from a board on the

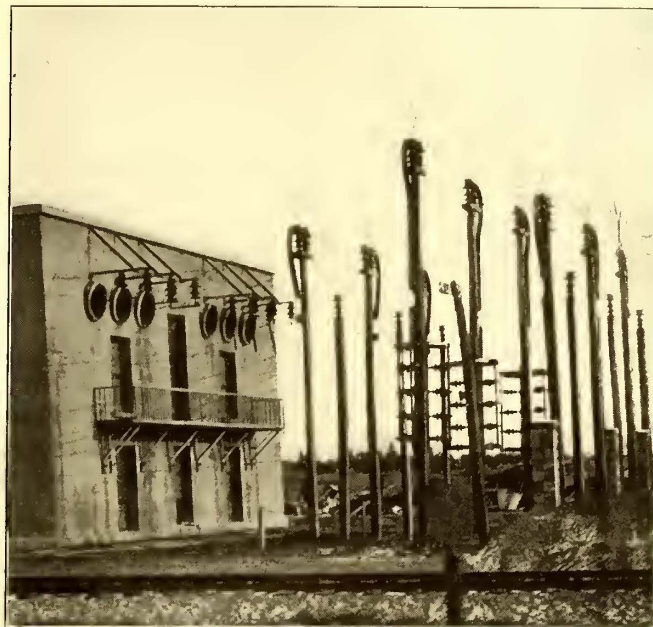
river side of the station. This board has 12 feeder panels and seven tie panels. There are four tie circuits running to Station No. 6 and three tie circuits running to Station No. 3. Some of the Edison three-wire circuits and the railway circuits are carried on a pole line across the river. The lines are supported on cross-arms, which in turn are held by I-beams fastened to concrete piers built on the river bed. The feeders are made up of 500,000 circ.-mil cables.

#### TRANSFORMER SUBSTATION

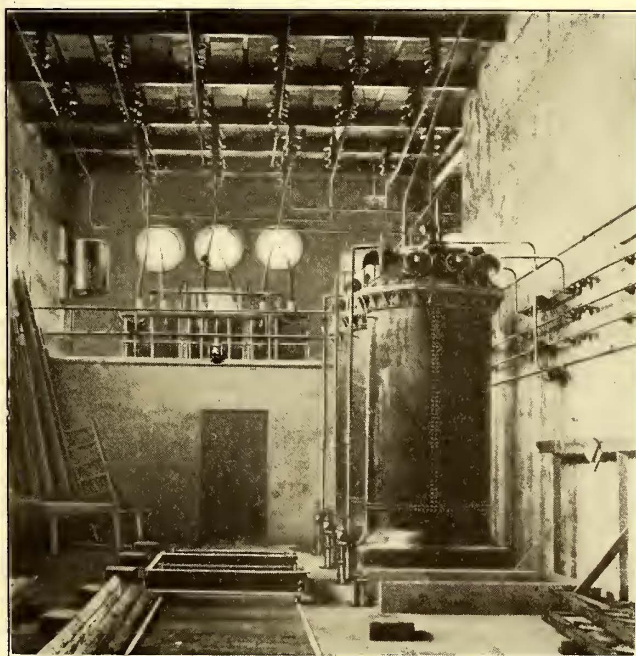
Although the Rochester Railway & Light Company possesses a miniature Niagara in the Genesee River, the latter stream has not the Great Lakes back of it, so that constancy is not one of its features. For this reason steam-driven units are kept in reserve, and having developed the water power to its economical limit, the question of carrying the ever-increasing loads was only answerable in two ways: Either the company had to install more steam-driven units or connect up to the Niagara transmission lines, passing outside of Rochester, on their way to Syracuse and the intervening towns. After careful consideration, the company found it expedient to contract with the Niagara, Lockport & Ontario Power Company to take an initial load of 4000 hp. To receive the energy and to transform it to pressures appropriate for its distribution circuits, the Rochester Railway & Light Company erected a transformer substation adjacent to the Lehigh Valley Railroad tracks at the corner of Elmwood Avenue. The building has been designed to accommodate an ultimate load of 24,000 hp.

The energy is delivered by the transmission company to the Rochester Railway & Light Company at the former's switching station at Mortimer, N. Y., at which point also energy is delivered to the Erie Railroad and from which

between both stations. The transmission line carries 60,000-volt, three-phase, 25-cycle current and before entering the transformer station the lines pass through protective apparatus carried on some 40 wooden poles. These poles contain three series of horn lightning arresters with air-gaps and resistance. The shortest path consists of a carbon resistance; the next consists of a concrete column and the longest path comprises about 15 ft. of thin



Rochester Power Plants—Exterior of Substation No. 33. Showing Incoming Niagara Transmission Lines



Rochester Power Plants—Interior of Substation No. 33. Showing Transformers and High-Tension Bus Construction Near the Ceiling

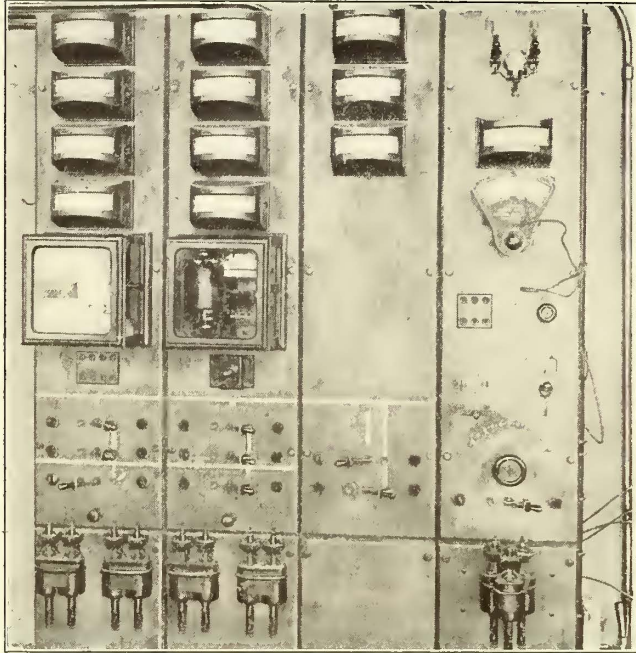
it is also sent on to Syracuse. From Mortimer the energy is brought over two separate transmission lines to the substation referred to, which is known as Station No. 33. The Niagara, Lockport & Ontario Company's switching station is located about 4 miles outside the city and 40-ft. to 50-ft. steel towers and aluminum cables run on a private right of way adjacent to the Lehigh Valley Railroad tracks,

copper wire acting as a fuse. The lightning arresters are of a type specially designed for the Niagara, Lockport & Ontario system. The theory on which these arresters are installed is that for ordinary slight static disturbances in the line, the arrester having the lower striking e.m.f. will discharge, and since it has in series with it a comparatively high resistance, the resultant disturbance due to the current which follows the discharge will be comparatively slight. A more severe static disturbance causes the arrester having the lowest gap and the arrester having the next higher gap to discharge simultaneously, thus affording two paths to earth, the combined resistance and inductance of which is much lower than that of the first path. When both arresters discharge the disturbing effect on the system, due to the generated current which follows, is much severer than that in the first instance. For a direct lightning stroke on the line, the three arresters would discharge simultaneously; the long, thin copper wire in the case of the arrester with the highest air-gap blowing and interrupting the arc upon it, the disturbance of the circuit finally ending upon the other two arresters.

The substation building is approximately 50 ft. wide, 120 ft. long and 30 ft. high. It is built of reinforced concrete, the walls being 16 in. thick and having an 8-in. space in the middle formed by the use of terra-cotta tile. The roof is made of tile laid on steel rafters and purlins, which are left bare underneath the tiling. The window frames are of metal with self-closing sashes in case of fire and wire-mesh glass. The building is divided into three parts—a two-story inlet room at the south end, a transformer room on the east side extending from the floor to the roof, and a two-story distributing room on the left side. The latter consists of an operating room on the second floor and an entrance and bus room on the lower floor. The lower

part of the inlet room is used for water-circulating pumps, a storage battery, bathroom and storeroom. On the upper floor are two Westinghouse oil circuit breakers. Each of the two sets of three lines pass to these from the lightning arresters, entering the building through six bull's-eyes made of 36-in. sewer crocks, each closed with a double window of glass, through which passes a large porcelain tube. The circuit breakers are equipped with inverse time relays.

After leaving the circuit breakers the conductors are car-



Rochester Power Plants—Front of Switchboard in Substation No. 33

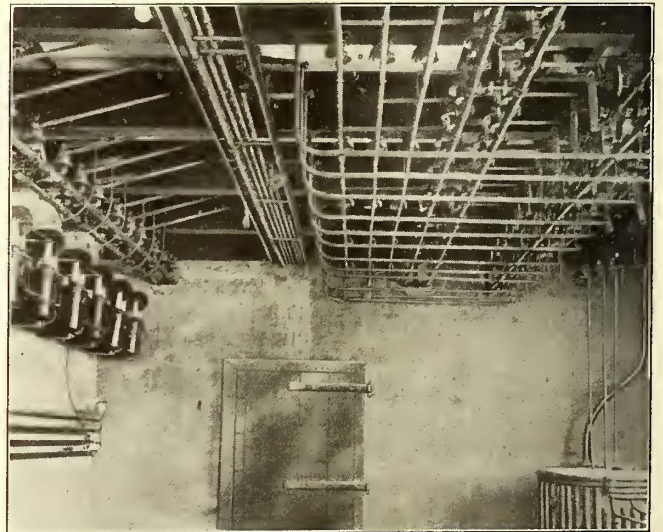
ried on insulators suspended from the roof rafters over the transformer room. The conductors form a loop here and are so arranged that any part of the ring bus can be isolated from any other part for repairs, alterations or additions. Practically all the conductors inside the building are bare copper or aluminum pipes. From the bus the circuit is carried to transformers which step down the voltage from 60,000 to 11,000, the pressure at which it is delivered into the city. At present four 1000-kw, oil-and-water-cooled transformers are installed, one of which is kept in reserve for emergency use. The transformer room is large enough to contain ultimately 18 of these transformers. In this room there is a pipe trench  $3\frac{1}{2}$  ft. deep and about 3 ft. wide extending down the center and normally covered with steel floor plates. On either side of the trench is a standard rail, the two forming a track for a small transfer car by means of which the transformers may be run to the north end of the room, which is partitioned from the main room and provided with a 16-ton hand hoist. This arrangement was considered preferable to a traveling crane, for though slightly less convenient, the infrequency of use makes this inconvenience tolerable, as against the larger cost of a traveling crane and the obstruction that the latter would have introduced in suspending the conductors from the roof. In the pipe trench are four main pipes, a cold-water pipe, a warm-water pipe, a clean oil pipe and a foul oil pipe. The circulating water is pumped from the Genesee River to a well inside the station building, whence it is repumped through the transformer coils and discharged to the river or run over a riffle board of concrete, where the water is exposed in a thin sheet to the atmosphere and to

slight evaporation. The riffle board saves the continuous lift of water from the river, which is 1500 ft. away.

In the operating room on the second floor is a tank holding enough oil to fill one transformer case. A similar tank is set into the ground floor of the inlet room, and in case it becomes necessary to repurify the oil in any transformer, a reserve supply carried in the foul oil tank is pumped through the oil dryer and filter to the clean oil tank on the second floor. A valve on the transformer is then opened and the foul oil flows by gravity to the submerged tank. The foul oil valve is then closed and the clean oil valve opened, whence the transformer case is rapidly filled from the elevated storage tank. The foul oil can then be dried and filtered in a leisurely manner by a Westinghouse outfit for dehydrating the oil.

After leaving the transformers the energy at reduced pressure is delivered to the bus room on the first floor on the west side of the building, passing upward and downward to and from oil circuit breakers located on the operating floor above, until it is finally delivered to the underground cables connecting the transformer substation with Station No. 6. The connections in the bus room are so arranged that energy can be delivered from any set of transformers to any outgoing feeder without interfering with the general scheme of operation. Aside from the switchboard and clean oil storage tank there is nothing on the operating floor except the 11,000-volt oil switches. For operating the switches when the ordinary circuit provided for that purpose is not alive a battery of 66 cells, charged for a mercury rectifier set, is installed. The building is heated electrically and for the circuits in the station, two three-phase transformers are installed; each of these is rated at 40 kw.

In the entrance room a 1000-kw, three-phase, 25-cycle



Rochester Power Plants—Busbars Under 11,000-Volt Switches in Substation No. 33

transformer is installed. This steps up the voltage from 11,000 to 18,000 for transmission over a wooden pole line 27 miles long to Canandaigua, where a motor-generator set is installed for carrying the railway load of the Rochester & Eastern Rapid Railway. Aluminum wire is used on this transmission circuit.

The motorman who was responsible for the wreck on the Berlin Elevated Railway last September, described in the issue of this paper for Oct. 10, 1908, has been sentenced to 21 months' imprisonment.



**RECORDING PATTERN MOVEMENTS IN BROOKLYN**

The mechanical department of the Brooklyn Rapid Transit Company has developed several cards and other forms to keep accurate track of the movements of patterns as manufactured and sent to foundries at different times. The principal record is kept on the office card (6 in. x 4 in.) reproduced in Fig. 1. This gives the plan and pattern numbers, a description of the casting, with a sketch of the same on the back of the card; kind of pattern; when made and completed at the Fifty-second Street shops; weight, cost, castings, coreboxes and pieces. The foregoing items cover the permanent data relative to any particular pattern, but to trace its movements between

Patt.No.	<b>7940</b>	Description	<i>Brake Shoe Head, Driver.</i>					
Elab.No.	<i>5452</i>		<i>Brill "Eureka" M.T. Truck.</i>					
KIND OF PATTERN	Ordered	Compltd.	Cre.Bxs.	No.Pecs.	Weight	Cost	Castings of	
Wood D. Shrinkage	<i>9-2-'08</i>	<i>9-14-'08</i>	<i>0</i>	<i>1</i>	<i>1lb.602</i>	<i>14 .30</i>		
Metal <i>Aluminum</i>	<i>9-3-'08</i>	<i>10-9-'08</i>	<i>5</i>	<i>6</i>	<i>10 lbs</i>	<i>24 .35</i>	<i>Steel</i>	
Kind	Shippg. Ord.	Recd.at S/R	Rept.No.	Foundry	Ret. Notice	Red. 52d St.		
<i>Wood</i>	<i>9-8-'08</i>	<i>9-16-'08</i>	<i>516</i>	<i>Magnus</i>	<i>9-29-'08</i>	<i>10-1-'08</i>		
<i>Metal</i>	<i>9-8-'08</i>	<i>10-9-'08</i>	<i>523</i>	<i>Johnson</i>				

Fig. 1—Superintendent of Equipment's Office Record

Patt.No.	<i>7940</i>	Description	<i>Brake Shoe Head, Driver - Brill M.T. Truck.</i>			
KIND OF PATTERN		Core Bxs.	No. Pecs.	Completed		
<i>Double Shrinkage Wood</i>	<i>Gate Alum'n</i>	<i>0</i>	<i>1</i>	<i>9-14-'08</i>		
Kind of Pattern	Sent to	Date	Returned			
<i>Wood</i>	<i>Magnus</i>	<i>9-16-'08</i>	<i>10-1-'08</i>			
<i>Aluminum</i>	<i>Johnson</i>	<i>10-9-'08</i>				

Fig. 2—Shop Card Record

**TRANSIT DEVELOPMENT COMPANY  
MECHANICAL DEPARTMENT**

52nd St. Surface Shop. PATTERN REPORT — October 9th. 1908.

Pattern Number	Completed	Weight, Lbs Ozs	Cost	Ret. from Foundry	Re-paired	No. of C. Bxs	No. of Pecs	Kind of Pattern	Material	No. Gtd
<i>7940</i>	<i>10-9-'08</i>	<i>10 0</i>	<i>\$24.38</i>			<i>5</i>	<i>6</i>	<i>S</i>	<i>Aluminum</i>	<i>0.</i>

This form must be filled out and promptly forwarded to Supt. of Equipment, giving full information in every case. For Remarks use reverse side of this sheet.

Fig. 3—Manufacturing Cost Report to Superintendent of Equipment

**The Brooklyn Rapid Transit System**

Brooklyn, N. Y., Oct. 9, 1908.  
 M. W. J. S. Johnson & Co.,  
 Spruynell, N. Y.  
 We have forwarded to you to-day via *Am. Exp.* the following patterns

Pattern No.	No. of Core Boxes	DESCRIPTION	Order No.
<i>7940</i>	<i>5</i>	<i>Driver Brake Shoe Head, Brill M.T. Truck.</i>	<i>24100.</i>

Very truly yours,  
 LINCOLN VAN COTT,  
 Purchasing Agent

Fig. 6—Postal Card Notification of Shipment

the storehouse and foundries from time to time, 14 lines are left under the following headings: kind of pattern, shipping order to storeroom, date of receipt of order at storeroom, receipt number sent by foundry on return postal card; name of foundry, notice to purchasing agent

to return pattern on its becoming obsolete, and notice of receipt at the Fifty-second Street shops. A smaller record card (5 in. x 3 in.), shown in Fig. 2, is kept at the shops and bears the data indicated in the reproduction.

Fig. 3 shows the shop's report (5 3/8 in. x 8 1/4 in.) to the superintendent of equipment, giving the original manufacturing details on a given pattern. Figs. 1, 2 and 3 are all printed on a Gammeter multigraph, which is used with equal success on hard or soft paper. Fig. 5 illustrates the shipping order (8 1/4 in. x 11 in.) sent to the storeroom when a pattern is to be turned over to a foundry. It will be noted from the text thereon that with every order the general storekeeper is given an explanation by some re-

FROM  
**TRANSIT DEVELOPMENT CO.**  
 PURCHASING DEPT.  
 520 ST. AND SECOND AVENUE BROOKLYN, N. Y.  
 Aluminum PATTERN NO. *7940.*  
 5 CORE BOXES LOOSE CORE PRINTS  
*Driver Brake Shoe Head, Brill M.T. Truck*  
 SHIP TO *J. S. Johnson & Co.*  
*Spruynell, N.Y.*

Fig. 4—Shipping Tag

**SHIPPING ORDER**  
 ORIGINAL. For Storeroom Office.  
 Order must be countersigned by General Storekeeper before material is offered for shipment.

GENERAL-STOREKEEPER: \_\_\_\_\_

Please ship the following *Double Shrinkage Wood Pattern-*

ORDER	Quantity	Casting Order	PATTERN	DESCRIPTION
<i># 88463.</i>			<i>7940</i>	<i>Brake Shoe Head, Driver</i>
<i>Magnus</i>				<i>Brill M.T. Truck</i>
<i>Metal Co.</i>				

Explain on following lines why shipment should be made.

*For Aluminum casting, for Pattern.*  
*See letter Sept. 3, '08 from Supt. of Equipment to Magnus Metal Co. ordering casting.*

Ship to \_\_\_\_\_

Address: \_\_\_\_\_

Date *Sept. 8, 1908*

Accept for Shipment \_\_\_\_\_ Signature, Employee Requesting **CHIEF DRAFTSMAN**

General Storekeeper \_\_\_\_\_ Date \_\_\_\_\_ 190

Received \_\_\_\_\_ 190 \_\_\_\_\_ Receiving Clerk.

Fig. 5—Shipping Order

File No. *523,* *Oct. 10, 1908.*

Received from the BROOKLYN RAPID TRANSIT SYSTEM the following patterns

Pattern No.	No. of Core Boxes	DESCRIPTION	Order No.
<i>7940</i>	<i>5</i>	<i>Driver Brake Shoe Head, Brill M.T. Truck.</i>	<i>24100.</i>

Per \_\_\_\_\_  
 Please sign and return at once.

Fig. 7—Return Postal Card Receipt

sponsible person. Fig. 4 is a reproduction of the descriptive shipping tag (4 1/4 in. x 2 1/8 in.), which accompanies a pattern shipment to the foundry. In addition to the tag, a double notification postcard is sent to the foundry from the office. The return half serves as a receipt.

**THE REDUCTION OF EQUIPMENT FAILURES AND MAINTENANCE COST ON THE THIRD AVENUE RAILROAD SYSTEM, NEW YORK**

When on Jan. 6, 1908, Judge Lacombe, of the United States Circuit Court, appointed F. W. Whitridge as separate receiver for the Third Avenue Railroad Company of New York, rapid steps were taken to provide the new organization needed for the maintenance of the rolling stock. The

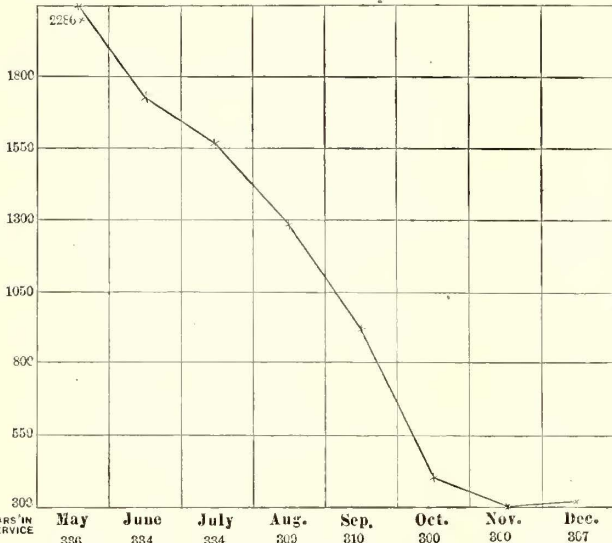
proved by the accompanying car equipment payroll curve which shows that the amounts paid out weekly for this item dropped from \$6,000 in the last week of April to \$3,100 in the week ending Jan. 28. The unusual depressions appearing at intervals in the general downward trend of the pay-roll curve were due to the holidays indicated.

It would be difficult to argue more strongly for the sound inspection and maintenance principles adopted by this company than merely to place these two curves side by side. This comparison certainly bears out the adage that "A stitch in time saves nine," even if the actual proportion is not so favorable as the proverbial one. The elimination of so many failures also has brought about an enormous saving in car-hours, although this item has not been taken into account in the saving of maintenance charges presented in this article.

**PLOW AND BRAKE TROUBLES**

Up to May, 1908, plow troubles of this railway company constituted over one-third of all equipment failures. In May, for instance, there were 896 plow breakdowns out of a total of 2286 defects from all electrical and mechanical causes. It should be remembered that a plow failure invariably means a disabled car, whereas other troubles are usually not serious enough to prevent the car from reaching the car house unassisted. This item, therefore, received special attention and with such success that by November plow troubles had been cut down to 130. Despite the severe weather during December, the total plow failures for that month did not exceed 180.

This remarkable reduction was due in part to the original thorough overhauling, but even more to betterments in the wiring connections and insulation of the plow. It was not



**Third Avenue Railroad Equipment Failures—Chart of All Failures for Eight Months**

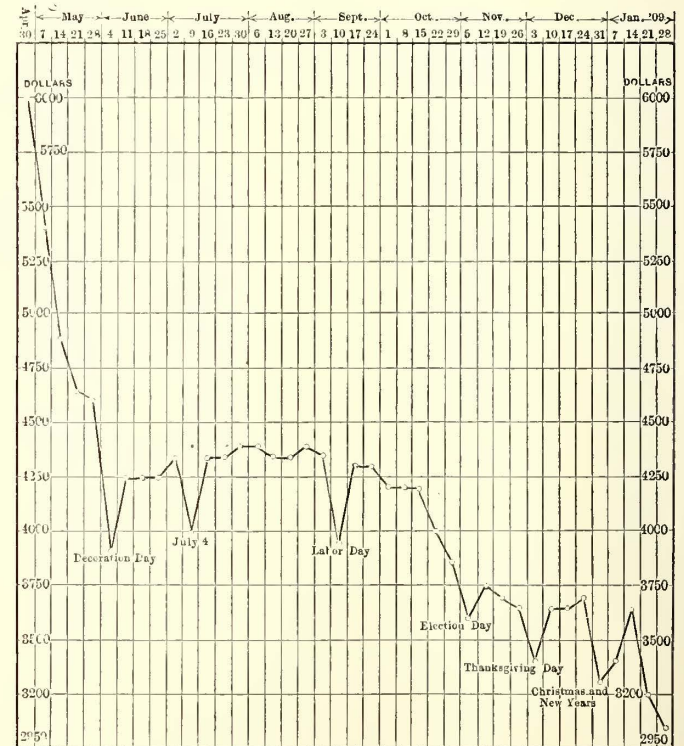
new buildings and reconstruction work of the Third Avenue Railroad Company are nearing completion under T. F. Mullaney, chief engineer. In the meantime the maintenance organization has been perfected by E. A. Maher, general manager.

To maintain the cars at the top notch of efficiency after their initial overhauling in April and May, 1908, it was determined to inspect them weekly, or at practically 800-mile intervals, and to send them into the shops for general overhauling every time they completed 10,000 miles. The new system, in combination with several improvements in car equipment parts, has brought about an enormous decrease in breakdowns from various electrical and mechanical sources. The remarkable trouble reductions in each class of apparatus are shown in the accompanying curve sheets which chronicle conditions from May, 1908, when the new maintenance forces were organized. Each set of curves also shows the number of cars actually running at the end of each month. The highest number operated was 334 in May, and the lowest was 300 in October and November.

**GENERAL REDUCTIONS IN DEFECTS AND LABOR COST OF MAINTENANCE**

The general improvement throughout the Third Avenue Railroad system is illustrated by the first curve, which is a summary of the troubles arising from the several electrical and mechanical sources detailed in the later curves. In May, about the time the overhauling process was fairly under way, there were 2286 failures on 336 cars, or about 6.8 per car per month; during November and December there was but one failure per car per month.

One would naturally be inclined to assume that this great improvement in the rolling stock must have been effected by spending extraordinary sums for inspection and repairs. On the contrary, the labor cost for maintenance is now only one-half of what it was last April. This is



**Third Avenue Railroad Equipment Failures—Chart of Maintenance Force Pay Roll**

necessary to alter the plow shoe and spring mechanically. The leads formerly were connected up without any copper terminals and were bunched under the shoe spring in such a way that the spring constantly tended to abrade the insulation. Rubber bushings had also been used to insulate the shoe from the spring, and in time the rubber would

get hot, thereby causing the connection studs and shoe to loosen. Charred boards, short-circuits and fuse blow-outs have been practically eliminated by using copper terminals to secure better contact; by embedding the leads on the board in insulating compound to prevent their creeping over to the board angle-iron through carbonization; by replacing the rubber bushings with red horn fiber and insulating the studs with mica tubes, and, in general, by building up the plow in the best possible manner. By concentrating all plow repairs at the main shops under the personal supervision of an expert, absolute uniformity is assured.

The record of brake failures has been plotted on the same sheet as the plow figures. In this case, the maximum number of troubles was reached in June with a total of 330. During the summer months all cars were equipped with a specially designed inside-hung brake rigging to displace the old fork-rod, outside-hung brakes. During June and July, also, 125 new cars out of 334 cars in service were equipped with Peacock brakes, and by the end of September brake failures dropped to 200. Three months' operation with the new brakes indicated that a smaller drum would be more advantageous. After this change in drums was made, the failures dropped to 30 in November. Although they rose to 80 in December, even the latter figure is less than 25 per cent of the number of failures in the month of June. The company has decided to use the Peacock brake on the 350 new pay-as-you-enter cars.

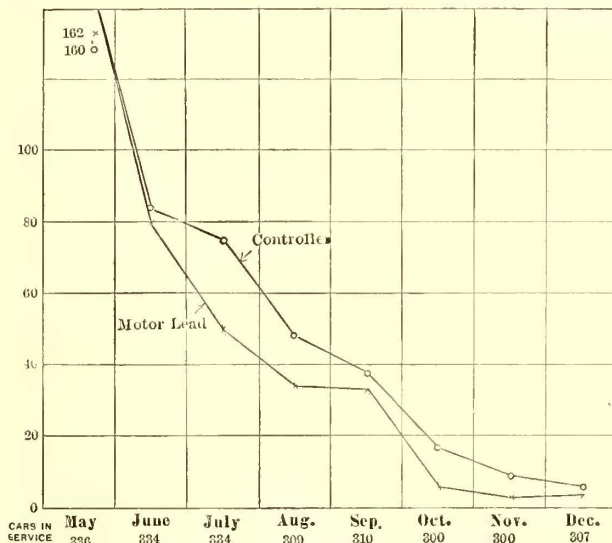
CONTROLLER AND MOTOR LEAD CURVES

Of the controller and motor lead troubles, it may be said that they no longer exist. In December last there were just eight failures from controllers and four from motor leads, against 160 and 162, respectively, for May, 1908.

In the course of the general overhauling, all controllers were brought into the shop and stripped bare. They were supplied with new wire, new fingers and boards, completely reinsulated and given any other treatment necessary to make them as good as new. It was not necessary to change their design in any respect.

so exposed that it was very liable to waterlogging. A great many of the circuits gave trouble because they were made of strand wire.

The re-wiring of the car circuits was done with conduit along the lines of the specifications adopted for the new pay-as-you-enter cars described in the Nov. 21, 1908, and Jan. 23, 1909, issues of the ELECTRIC RAILWAY JOURNAL. The motor circuits now are brought to the motors without touching the floor by carrying them on an iron bracket at-



Third Avenue Railroad Equipment Failures—Chart of Motor Lead and Controller Failures

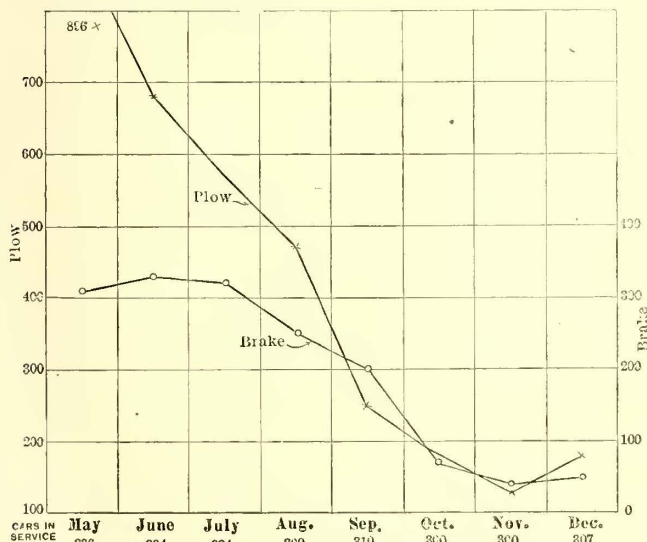
tached to the cross-sill at right angles. This bracket extends quite close to the motor so that the length of suspended and exposed wire is considerably reduced. Each lead is bolted on the bracket and joined with the incoming wire by a clasp connector and a little taping, over which a sleeve is placed for protection. The leads are easily and quickly disconnected by loosening the bracket bolts, pulling off the sleeves and unwinding the trifling amount of tape. The wires now used are of the flexible type covered with 30 per cent Para rubber and triple-braid. Car-house men are not permitted to repair motor leads, but must send the cars to the shops. The remarkable drop in motor lead failures, indicated by the curves, certainly proves that the new arrangements are thoroughly satisfactory.

ARMATURE FAILURES

The three curves for armature failures show that general detail repairs, re-winding and melted bearings are tending to hover around zero. The main cause for this betterment is the conscientious examination of the bearings every time the cars come in for inspection. About 75 per cent of the hot bearings was caused by the wearing out of dowel pins, thereby permitting the bearings to turn in their shells. The general overhauling also brought to light a large number of short-circuited and short-weight fields and the brush-holder tension was found to vary from 1 lb. to 15 lb. New bearings, dowel pins and fields were provided and the brush-holder tension fixed at 7 lb. throughout. The inspectors give particular attention to pole clearance and use a fiber gage for this purpose when the bearings are getting dangerously low.

JOURNALS, CIRCUIT BREAKERS AND GEARS

In June, 86 cars were pulled in for hot journals and in November none at all. There were, however, 12 hot journals in December, in consequence of the breaking in of 150 pay-as-you-enter cars. These new cars are now giving as

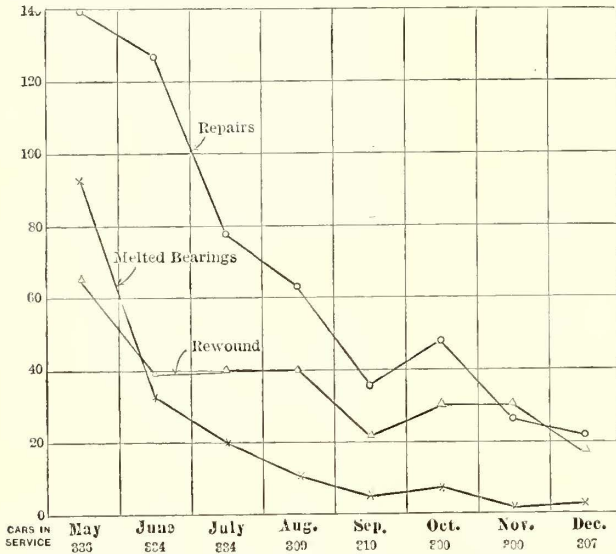


Third Avenue Railroad Equipment Failures—Chart of Plow and Brake Failures

The cars, as originally wired, had the motor circuits run in rubber hose on strap-iron hangers attached to the car cross-sill, from whence they were taped in with the motor leads without any intermediate support. Consequently these circuits were close to the car flooring at the trap doors and the connection between the sill and motor was

little trouble in this respect as the old ones. The striking point about this journal record is that it has been made possible simply by thorough maintenance, as no change was made in the design, babbitt metal or lubrication of the journal boxes.

Circuit-breaker troubles reached their maximum in June, with 43. The thorough overhauling of the breakers, with the concurrent rehabilitation of the motors and controllers



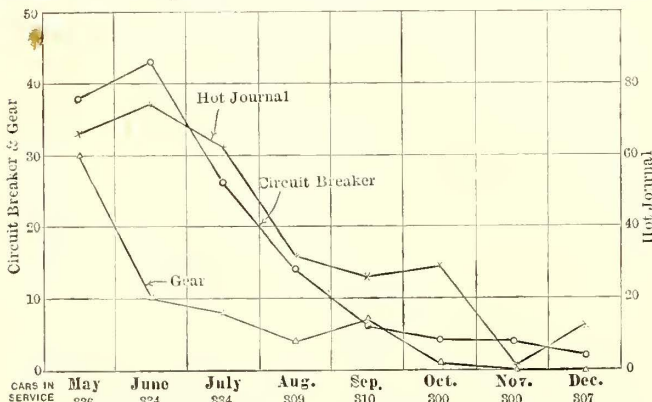
Third Avenue Railroad Equipment Failures—Chart of Armature Failures

and the adoption of periodical inspection, has eradicated almost entirely failures of this character.

Gear lubrication has been given such close attention that not a single gear failure occurred during November and December, while seven months before gears were responsible for 30 pull-ins.

ORGANIZATION DETAILS

The general inspection of all cars operated by the Third Avenue Railroad Company is now carried on in four car houses, as follows: Grand Street and East River; 129th Street and Amsterdam Avenue; 129th Street and Third Avenue, and Sixty-fifth Street and Third Avenue. The latter building group also contains the general repair shop for the entire system. The car maintenance department is



Third Avenue Railroad Equipment Failures—Chart of Failures of Journals, Circuit Breakers and Gears

headed by J. S. McWhirter, superintendent of equipment. The repair division is under the general foreman of the repair shop and the foreman of electrical repairs, both at Sixty-fifth Street, and a separate foreman in charge of each of the inspection quarters. An office staff at Sixty-fifth Street has charge of all maintenance records.

The policy of having the repair work done at one place is working out very well, as it enables the management to select specialists who can be held responsible for maintaining the standards adopted for each kind of work. Thus one man specializes in packing journal boxes, another in connecting motor leads, etc. A great deal of trouble arose in the past from ignorant and irresponsible workmanship at the car houses. Hereafter all important maintenance will be conducted at the one place where the best labor and facilities are available.

CINDER CONCRETE FOR TRACK SUBSTRUCTURE

The United Railways Company of St. Louis is experimenting with cinder concrete for track construction. It is being used on about one mile of track on which the 7-in. rails and ties are in good condition, but on which the ballast was poor. In fact, the foundation of this track before it was relaid was in such shape that the granite paving blocks would work up and down with the passage of cars and wagons and thus afforded an imperfect street surface. For this reason the experiment was tried of removing the subgrade and refilling with cinder concrete.

The work was carried on by putting in crossovers and discontinuing the use of one of the tracks in sections. This abandoned track was blocked to surface. The old macadam was then removed and drawn away for use elsewhere. In its place to a depth of 6 in. under the ties and to a height of 1 in. above the ties was placed a mixture of cinder concrete containing six parts cinders, two and one-half parts sand and one part cement. Before determining upon these proportions experiments were made to ascertain the proportion of voids in various mixtures of cinders, sand and cement. The results showed that the 6:2½:1 mixture was a proper one. It is interesting to note that this mixture, of which the body is cinders, has the same proportions as that which the company uses in making concrete with crushed rock.

Cinder concrete has an advantage for street use in that the main body of the material—the cinders—is light and can be handled with scoop shovels. It is stated that because of this condition only one-half as many men are needed to feed the mixer as would be required if rock were used. It will be interesting later to learn how well the cinder concrete withstands the street and wheel loads and whether the sulphur in the unburned coal affects the rails

STREET RAILWAYS IN FRANCE AT THE END OF 1905

The January number of the *Zeitschrift für Kleinbahnen* contains the latest statistics of the street railways of France. These are for the year ending December, 1905. The total length of track was 8744 km (5321 miles), of which 6811 km (4223 miles) were in operation, and the balance under construction or proposed. The increase in mileage over the preceding year was 638 km (395 miles). Most of the lines are meter (39.37 in.) gage. The invested capital for the 4223 miles in operation was approximately 900,000,000 francs. The French Government also assisted a number of electric railway lines in 1905 by granting subsidies amounting to about 5,000,000 francs. Freight service, in addition to passenger service, was given on 4591 km (2846 miles).

An electric railway 130 miles long has been proposed to pass through the Caucasus. Two hydro-electric stations, with a total capacity of 13,500 kw are contemplated.

## CAR DEFECTS DISCUSSED BY NEW ENGLAND STREET RAILWAY CLUB

The regular monthly meeting of the New England Street Railway Club was held at the American House, Boston, on Jan. 28, with Vice-President W. D. Wright in the chair. John Lindall, superintendent of rolling stock and shops, Boston Elevated Railway Company, read a paper on "Car Defects." An abstract of the paper follows:

### CAR DEFECT CAUSES

There are five important causes of car defects: First, equipment inadequate or not properly designed for the service; second, equipment not properly assembled or having shop defects; third, defective material; fourth, defective handling or operation of cars; fifth, defective inspection or maintenance. Accidents and defective track also may cause car defects.

### INADEQUATE OR IMPROPERLY DESIGNED EQUIPMENT

As defective design is generally very hard to remedy after motors have been put in service, it behooves a railway company's engineers to use great care in figuring out car equipments, and to consider all factors bearing on the service expected. Abnormal conditions should receive more consideration in many instances. It appears that equipment is usually designed to meet the best conditions. The motors may meet these requirements, and are accepted, but in a short time they begin to give trouble. There is wear in the bearings, pinion and gear; the contact becomes sliding or grinding, rather than rolling; there is lost motion in the journal boxes, truck pedestals and brake rigging, and the brakes do not release as freely as before. All of this adds to the work of the motors. In addition, if the motors must go through a heavy snow storm, the strain is likely to cause trouble unless the capacity is adequate.

### SHOP DEFECTS

Manufacturer's shop defects seem to be inevitable, even with careful inspection and checking. Some one has not used proper care in wiring, thus causing burn-outs. Some one has overlooked the fact that field castings left rough back of the field coils result in grounding many coils. Brushholder pins work out because they have not been properly secured. As the final elimination of such troubles lies with the manufacturer, equipment men should see that all car defects are properly analyzed and that those chargeable to the manufacturers should be brought to the attention of the latter.

### DEFECTIVE MATERIAL

Material is defective if it is not the best for the purpose to which it is applied. It is easy to figure from past consumption that a saving of "so much" can be made on certain material, bought, say, at 10 per cent less initial cost than that which has been used previously. The shop test may indicate that all is well, but it frequently happens that the service results are different from those in the shop. Hence if a large quantity of the material has been delivered and paid for, there is no way of repairing the damage by the time the cause is found. It is often a difficult matter to prove that material has not met the requirements, and in the meantime who is to pay for the losses and injuries caused by breakdowns of motors and generators? The varnish maker, for example, will hardly admit that such failures are chargeable to him. It is a good plan to go slowly in changing an article that has been giving good satisfaction and make sure that the substitute really is equally as good.

### IMPROPER HANDLING OF EQUIPMENT

The way cars are handled in service has a very material bearing on car defects. The maintenance and inspection committee of the American Street & Interurban Railway Engineering Association for 1907 found that in the judgment of operating men 42.6 per cent of the commutator and brushholder troubles are due to fast feeding of controllers. If this is anywhere near correct, and the same proportion holds good for failures in other parts of the electrical equipment, it is very evident that the railways can afford to spend considerable money and time in the better training and constant checking of their motormen.

### DEFECTIVE INSPECTION AND MAINTENANCE

All car defects, such as brakes out of adjustment, worn-out brake chains, short motor carbons, worn-out trolley wheels, cut bearings, armature down on poles, etc., come under defective inspection and maintenance. It is the one great defect over which the car house men have direct control. To eliminate this it is necessary to have a properly organized, competent force, adequate and properly arranged shops and a complete system to work by. Mr. Lindall then described the system of defect records used by the Boston Elevated Railway Company for the past three years. He showed representative blank forms, charts of equipment failures, and the way in which the records originate and are compiled for the mechanical, operating and legal departments. This system was described fully in the STREET RAILWAY JOURNAL of April 4, 1908. Additional information, however, is outlined in the following paragraphs:

The system embraces daily reports made at car houses, record cards kept at car houses, and tabulation cards kept at the office of the superintendent of rolling stock and shops. The detailed forms include a car house log sheet, equipment records filed in tin boxes at the car houses, control, motor, truck, air brake, car body and inspection records. The inspection record by the pitman is practically a written guarantee of his work on inspection. The original records made by workmen are preserved without copying. These are checked by the foreman, and then a number representing one day's work are secured by eyelets and filed in chronological order by months. It takes but a few moments to locate any workman's card for any particular date.

In December, 1905, monthly meetings of division superintendents and car house foremen were instituted at Mr. Lindall's headquarters to compare notes and to give necessary special instruction relative to equipment. The results shown by the defect record system are always fully discussed at these meetings. As different car houses are compared, rivalry to make good records has been stimulated and general interest awakened. A definite subject is also assigned for discussion at each meeting. Among these subjects have been car brakes, motors, overhauling of open cars, overhauling of closed cars, car wiring, air brakes, gearing, shop kinks and motor gearing.

Up to about April 1, 1906, no satisfactory method of obtaining car mileage had been found, but the advantage of being able to inspect cars and make repairs on a mileage basis instead of a time basis was very apparent. A car mileage system was also necessary to make motor-mile comparisons. It had been the company's custom to keep complete records of register readings by trips, so it was arranged that toward the close of each day the starter should draw off the total trips for the cars on each route

and from a table of trip distances find the total car miles made by each car. This information is sent to the car house foreman. On individual car records the reading is made continuous, so that the last figure for December indicates the total year's mileage.

Among the matters bettered through the use of the defect records are the breakage of window glass, mechanical troubles in motor armatures, motor flashing, readjustment of resistances to improve acceleration, redesigning of brake rigging in some types of trucks, improvement of motor brushes, brushholder betterments, increase of commutator life, and replacement of old motors by modern designs. Improper operation of cars has been taken up with the inspectors and motormen instructors by using graphic methods of showing the right and wrong ways of controller handling and by explaining and interpreting automatic ammeter records.

DISCUSSION

A discussion followed the reading of the paper. John W. Corning, electrical engineer of the Boston Elevated Railway Company, described the work done with the automatic ammeter to improve car operation. E. W. Holst, superintendent of equipment of the Boston & Northern and Old Colony Street Railway companies, discussed the importance of co-operation, improved methods, efficient inspection, good workmanship and suitable material. M. V. Ayres, electrical engineer of the Boston & Worcester Street Railway Company, emphasized the easier conditions surrounding the operation of substation machinery in comparison with apparatus run on the road. D. E. Manson, manager of the Boston office of the Westinghouse Electric & Manufacturing Company, voiced the effect of reductions in maintenance cost on the net earnings of traction properties and on the improvement of railway securities.

In conclusion, Mr. Lindall stated that co-operation is a most important factor in the success of such a record system. In 1907 there were 20 per cent less defects than in 1906, and in 1908, 59 per cent less than in 1907. One additional clerk has handled the record system. Perhaps a half-hour to an hour daily is required by the foremen's work on the records. The foremen's report of defects is checked by a separate record in the hands of the division superintendent.

THIRD AVENUE CORRESPONDENCE

Frederick W. Whitridge, receiver, Third Avenue Railroad Company, New York, has had printed a volume of 429 pages containing portions of the correspondence during 1908 between himself as receiver of the Third Avenue Railroad Company and the Public Service Commission, First District. Mr. Whitridge states his reason for printing this correspondence in the preface, but many readers will hardly agree with him that all parts of it are "dreary stuff." The preface says:

The following correspondence between the Public Service Commission and the receiver of the roads forming the Third Avenue system is printed for the purpose of record and the convenience of reference.

It is pretty dreary stuff and would have been intolerable except for the opportunities it occasionally afforded for amusement, but perhaps it may, in the future, be of interest to some student of governmental regulations.

It includes only a little more than half of the correspondence. The remainder is either reiteration or entirely senseless. Page 266 et seq., comprise complaints. The letter of the commission on page 266 is a form which comes with every complaint, and for economy of space is only printed once.

The pages devoted to the orders of the commission include the orders up to No. 740, with the replies of the company. The complaints, published in the following pages, cover a variety of subjects. Among them are many in regard to noise which the Third Avenue cars make in passing around curves and over special work. In some cases, the suggestion is made that this track work be moved so as to be in front of another person's premises. All were courteously answered by the receiver, who explained the impossibility of following this suggestion, but agreed in one case to investigate whether the cars could not be run without noise or at least with only a noiseless noise. Considerable space is given to the correspondence between the company and the commission in regard to the new classification of accounts which the company's auditors evidently had difficulty in understanding and applying. At one stage, Mr. Whitridge returned to the city and found that the auditor had resigned owing to the onerous demands made upon him by the commission in this connection. As the officer was invaluable and possessed the confidence of the holders of what was left of the securities of the company, the receiver prevailed upon him to remain, after agreeing to establish a separate department whose sole duty it should be to reply to the communications of the commission.

AN ODD TRANSFER

The Waverly, Sayre & Athens Traction Company, of Waverly, N. Y., operates between Waverly, N. Y., and Sayre and Athens, Pa., the three towns forming practically one community. In Waverly the company operates a local belt line, transfers to which are given to passengers com-

GLOBE TICKET COMPANY, PHILA., PA.		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16														
		Jan.   Feb.   Mar.   Apr.   May   June   July   Aug.   Sept.   Oct.   Nov.   Dec.														
A. M. AFTER THE HOUR P. M.		17 18 19 20 21 22 23 24 25 26 27 28 29 30 31														
		<b>WAVERLY, SAYRE &amp; ATHENS TRAC. CO.</b> TRANSFER TICKETS ARE NOT TRANSFERABLE NOTICE: Good only when punched correctly as to Time, Date and Transfer Point. Transfers will not be issued on a transfer. Ask Conductor for transfer when paying fare. Passengers are requested to read transfer and see that they are correctly punched. If conductor refuses to accept transfer, fare should be paid and circumstances promptly reported at office. W.S.&A.T.CO.														
EVEN HOUR		148001 Paper Punched Aug. 8, 1908														
		SAVERLY & ATHENS CLINTON AVE. E. WAVERLY & CHEMUNG ST. WAVERLY & S. WAVERLY SAYRE & S. WAVERLY S. WAVERLY & SAYRE ATHENS BOHOLICH LINE STATE LINE EMERGENCY Conductor No.														
		1	2	3	4	5	6	7	8	9	10	11	12	MAN	WOMAN	CHILD

Transfer Punched to Indicate Age and Sex of Holder

ing from Sayre. The latter place contains the repair shops of the Lehigh Valley Railroad, which employs a large number of men who live in Waverly. Many of these passengers would ask for transfers they did not need merely to give them to the boys who loitered around the station. These boys would then use the tickets to ride around town. To stop this abuse the company adopted a transfer on which space was left in the lower right-hand corner for the words, "man," "woman," "child." In this way the boys were prevented from using transfers punched for an adult and the annoyance this practice gave was entirely eliminated. The idea of indicating the kind of passenger is not a novel one and is rarely used because the conductors must make an extra punch. In this case it was justified because it effectively remedied a serious annoyance.

A narrow-gage electric railroad, about 14 miles long and estimated to cost \$506,000, is to be built between Grossenlueder and Hanswurz, in the Frankfort-on-the-Main district. The councils of the town of Neuss have also voted for the construction of an electric railroad to connect that place with Grimmlinghausen and Neuserfurth.

**FENDER AND WHEEL GUARD HEARINGS IN NEW YORK**

The fender and wheel guard hearings of the Public Service Commission of New York, First District, were continued on Feb. 11 before Commissioner Maltbie.

The first witness was A. E. Kalbach, manager of the New York City Interborough Railway Company operating cars in the borough of the Bronx, New York City. Mr. Kalbach testified that the rolling stock of his company consisted of 15 closed, 15 semi-convertible and 10 open cars. These cars are not equipped with fenders, but have fixed pilot type wheel guards. His company had had very few serious accidents since the road was started in 1903 and he did not believe that any one of them would have been prevented either by a fender or a wheel guard. In one instance the fixed wheel guard had saved a doctor's life by pushing him along the track instead of permitting his body to get under the wheels. His company was desirous of experimenting with automatic wheel guards. The physical conditions on many of the routes of the company are such, however, that automatic wheel guards would probably trip often owing to irregularities in the paving and in the winter on account of snow and ice. Hence his company did not wish to decide upon any particular wheel guard immediately, but would prefer to experiment with different types.

J. L. Quackenbush, of counsel for Mr. Kalbach's company, asked Commissioner Maltbie what he thought of Mr. Kalbach's suggestion. The commissioner hesitated to express a definite opinion, but saw no objection to the company trying out two or three wheel guards, but he insisted every car must be equipped with some form of guard. He asked Mr. Kalbach if he knew how high above the rails the tripper was usually hung on automatic wheel guards. Mr. Kalbach replied 5 in. and that the wheel guard was set at about the same height. The commissioner pointed out that there would have to be a grade of 5 in. in 4 ft. to 5 ft. to cause a change in paving height great enough to trip such a device. Mr. Kalbach said that there were such places on the lines of his company, but admitted that the wheel guards could be reset from the platform and consequently such trippings were not serious. In reply to a question from Commissioner Maltbie, the witness said he thought the pilot guard was sufficient protection. He testified that in the accident case referred to the company had paid the injured doctor \$3,000. Commissioner Maltbie pointed out that it would cost hardly more than \$1,200 to equip the 40 cars of the company with wheel guards and said that such an investment would certainly pay for itself if it could prevent only one accident of this kind in a year.

Mr. Kalbach testified further that the cars on his company's lines sometimes ran at a speed of 16 m.p.h., but that the average speed between stops was 10 m.p.h. Mr. Quackenbush said that the damage suit referred to was due to a collision with the carriage of the doctor, and that the latter was thrown out in front of the car. Mr. Quackenbush then asked Mr. Kalbach to testify regarding the position of the company on the question of equipping its cars with projecting fenders in addition to wheel guards.

Mr. Kalbach said that he would be sorry to see the commission order fenders, because the danger would be increased rather than diminished, especially in neighborhoods where children play in the streets. They were also particularly undesirable on his company's lines because of the many curves. In laying out the lines they had been careful to provide the necessary clearances so that cars could

pass safely on curves. If projecting fenders were applied these clearances would not be sufficient and cars would be compelled to stop and thus lose time or else the fenders would have to be folded up at certain places. He also thought that accidents would be increased because people were accustomed to gage the distance of the car from observation of the platform position rather than by the position of the fender. He was not prepared to say that in some cases the fender would not save people from injury, yet in other cases people would be injured on account of the fender. It would be better for the public safety not to use fenders if the cars are provided with wheel guards. The question of cost did not enter into the matter, as it was the company's wish to operate the cars in the safest manner possible.

In reply to questions by Commissioner Maltbie, Mr. Kalbach said that he had not operated cars with fenders and that it was problematical whether a fender would cause less injury to a person struck by a car so equipped running 14 miles to 15 miles an hour than would a car without a fender. Of the two classes of safety devices Mr. Kalbach considered the wheel guard the more efficient. He said that his company operated on streets having heavy trucking, such as Tremont Avenue and 180th Street. Although these streets are wide enough for trucks to be run outside of the tracks, the drivers insist on taking the rails so that cars will push the wagons up the hills. In such cases as this fenders would be a nuisance. Commissioner Maltbie said that a folding fender would serve, but humorously remarked that this condition could not be obviated unless the Public Service Commission had charge of the Police Department.

At the request of the representatives of the Westchester Electric Railway, which operates about 10 miles of track in territory under the commission's jurisdiction, the hearing on its case was adjourned to 2:30 p. m. Thursday, Feb. 25. At this joint hearing the subject will be the use of fenders in the borough of the Bronx.

J. L. Quackenbush, general attorney for the Metropolitan Street Railway Company, said that he had classified the accident statistics of that company and found that only 7 per cent of them involved in any way the question of fenders and wheel guards.

J. J. Kuhns, representing the Coney Island & Brooklyn Railroad Company, asked for further time. He wanted to watch the experiments of the Metropolitan Street Railway Company and see Mr. Quackenbush's figures on accidents. Commissioner Maltbie pointed out that the Metropolitan hearing referred only to the question of the design of safety devices to be adopted and did not hinge on the principle of fenders or wheel guards. Mr. Kuhns did not know whether such devices would be valuable on his company's lines, as the Coney Island & Brooklyn Railroad had never tabulated the different kinds of accidents as had the Metropolitan Street Railway Company.

The next witness was W. S. Menden, assistant general manager and chief engineer of the Brooklyn Rapid Transit Company. Mr. Menden was anxious to know whether the commission would order safety devices on the elevated and private right-of-way lines of the company. Commissioner Maltbie said that each line would be considered in connection with its operating conditions. Fenders or wheel-guards would not be specified, for example, if a line crossed only a few highways.

Mr. Menden had brought some statistics on the history of fenders placed on cars in Brooklyn to show what his

company had done in the past. Within the last two years the Brooklyn Rapid Transit Company had expended \$100,000 to place 4000 fenders on 2000 cars. These fenders were of the Empire type and were installed after about one year's experimenting. This type of fender was not submitted at the commission's tests. The company adopted it because it was of a design that could be used anywhere. The Empire fenders replaced fenders which had been installed about 1903. These old fenders consisted of 1350 Crawford type with rope-nets, afterward replaced with wire netting, and 1000 New Sherwood type, some of which are still in use. In 1905 both the Crawford and the New Sherwood fenders were discarded because it was impossible to maintain them. Since 1903 fenders alone have cost \$150,000. At present most of the fenders are of the Empire type, some 10 per cent are of the Sherwood type and other miscellaneous designs are used on freight cars.

Mr. Menden had no special data on wheel guards. He said it had been assumed that the cost of wheel guards and fenders was warranted by the saving in accident damages. His company's records showed the contrary, because fenders and wheel guards do not reduce accidents though they may in some cases help to lessen injuries. Commissioner Maltbie said that the argument in favor of such devices was not that they prevented accidents, but prevented persons from being killed or from being injured more severely.

Mr. Menden said that such cases were comparatively few. In the six weeks preceding the hearing his company had operated practically 5,000,000 car-miles, and in that period there was but one accident in which a fender or wheel guard would have been a factor. In cases where the person struck had been fatally injured there was nothing to show whether or not the initial impact was responsible. If it was responsible then fenders and wheel guards were only of sentimental value.

Commissioner Maltbie asked Mr. Menden if he meant to say that the first impact of a fender would cause death. Mr. Menden replied that it might and especially when only a wheel guard is on the car, because the bumper strikes first. He said that it was a serious question whether it would pay to have either device from the standpoint of safety alone, but there was a sentimental value which could not be neglected. Unless it could be shown that recent designs of wheel guards and fenders are an improvement over previously tried devices money could be spent to better advantage by preventing accidents in some other way. He stated that for the month of December, 1908, as compared with December, 1907, the reduction in the number of persons struck was 12 per cent; for November, 38 per cent; for October, 6 per cent; for September, 18 per cent; for August, 13 per cent; for July, 28 per cent, etc. He believed that these figures showed that the remedy lay in improving the rolling stock, track, line and carmen, as well as educating the public to be more careful. At any rate, this was his experience in Brooklyn.

Mr. Menden said with regard to wheel guards that his company had installed them on 220 cars in 1905. These guards were of the Sterling-Meaker fixed type. All but 20 of them were discarded after six months' use, as they could not be kept on the cars because of local interferences and truck vibrations. These wheel guards had to be carried rather high as they had no automatic drop. The 20 cars still carrying these guards are running on the Williamsburg Bridge. The annual maintenance cost of these guards is two and one-half times that of the installation cost. They are kept at 5¼ in. above the rails.

Referring to the general adoption of wheel guards in Brooklyn Mr. Menden enumerated a number of objections such as high pavements, unpaved streets, temporary cross-overs where sewers or water mains are under construction, snow or ice on tracks and hose jumpers used in cases of fires. His company had not tried automatic wheel guards and wanted three or four weeks' time to consider their use. It had done nothing further about wheel guards since its original experiment. In reply to a question by Commissioner Maltbie, Mr. Menden said that he did not believe that his company had had more than two or three accidents in a year where the fenders were up. All the surface cars of this company are equipped with fenders carried 6 in. above the tracks. The fenders were effective in picking up persons from standing positions, but not in recumbent positions because the fender is carried so high. Commissioner Maltbie pointed out that the automatic wheel guards could be carried at any desirable height above the track and thus be easily adjusted to overcome obstructions.

The representative of the Ocean Electric Railway Company stated that his company had its 19 cars equipped with fenders. If the commission, however, ordered the wheel guards besides they would be put on, although his company had had no accident where a wheel guard would have been effective. The company does but little business in winter and has but a short summer season of heavy beach traffic.

Mr. Quackenbush, speaking for the New York & Queens County Railway Company, said that the conditions on that line were similar to those of the Ocean Electric Railway. The hearing on the Brooklyn and Long Island companies was then adjourned until 3:30 p. m., Thursday, Feb. 25.

#### ANNUAL CONVENTION OF THE AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION

The tenth annual convention of the American Railway Engineering and Maintenance of Way Association will be held in the Auditorium Hotel, Chicago, March 16, 17 and 18. E. H. Fritch, Monadnock Block, Chicago, is secretary of the association. In connection with the convention the manufacturers of railway appliances will hold an exhibition at the Coliseum. On the day preceding the first meeting of the Maintenance of Way Association sessions will be held by the Railway Signal Association. All of the meetings of both associations are open to engineers interested in track and roadway work. The reports to be presented by standing and special committees deal with subjects of interest to electric as well as steam railroad engineers.

Among the subjects to be presented by standing and special committees which are of interest to electric railway engineers will be the following: Roadway; ballasting; ties; rail; track; wooden bridges and trestles; masonry; signs, fences, crossings and cattle-guards; signaling and interlocking; records, reports and accounts; uniform rules for trackmen; iron and steel structures; economics of railway location; wood preservation; uniform general contract forms. The special committees to report include that on injuries to bridges and railroad structures due to flat spots on car wheels; that on injuries to signals, bridges and track due to brine drippings from refrigerator cars, and that on impact tests.

A committee on electricity has also been appointed, and undoubtedly will present a progress report. The mem-



bership of the committee is as follows: George W. Kittredge, New York Central; J. B. Austin, Jr., Long Island; W. W. Drinker, Erie; H. R. Talcott, Baltimore & Ohio; C. E. Lindsay, New York Central; G. A. Harwood, New York Central; A. S. Baldwin, Illinois Central; L. C. Fritch, Illinois Central; R. D. Coombs, Pennsylvania Terminal & Tunnel; E. P. Dawley, New York, New Haven & Hartford. The subjects which have been apportioned to this committee for consideration are transmission line crossings, clearances, insulation and protection, electrolysis, relation to track structure, maintenance and organization.

### ATTITUDE OF MASSACHUSETTS COMMISSION ON QUESTIONS AFFECTING CAPITALIZATION

In the report of the Public Service Commission of the Second District, New York, of which an abstract was published in the *ELECTRIC RAILWAY JOURNAL* of Jan. 23, 1909, page 135, the questions of discount on bonds, working capital and allowance for promotion services were discussed with reference to the practice of the Massachusetts commissions. The following has been received on this subject from the Boston correspondent of the *ELECTRIC RAILWAY JOURNAL*:

"Supplementing these notes, it may be stated that the Massachusetts laws place considerable discretion with the commissions in these matters of capital issues. The laws provide that a street railway or a lighting company may increase its capital stock or issue bonds to such an amount as the Board of Railroad Commissioners, in the one case, or the Board of Gas & Electric Light Commissioners, in the other, shall determine will realize the amount which has been properly expended or will be properly required and as the board in each case shall approve for the purposes set forth by the company's petition."

The attitude of the Railroad Commission appears to be about as follows in these matters:

**Discount on bonds.**—It is the practice of the board to figure bonds at par, stating when approving an issue that such approval is given to the issue by the company of bonds to an amount not exceeding at par value a stated sum then named as an issue of bonds reasonably necessary and of the amount required for the purposes to which the proceeds of such bonds are to be applied. The commission may or may not decide to permit securities to be issued for discount on bonds at such future time as this question may arise as such. It is understood that the commission does not undertake to determine the price at which bonds shall be sold, but approves or disapproves the borrowing through the bonds of a fixed sum, figured at par when referring to the bonds.

**Working capital.**—The board has never passed upon the question of working capital.

**Allowance for promotion services.**—These are taken into account, it is understood, in connection with engineering and legal expenses, and legitimate expenses of development or services in connection with promotion, according to the circumstances of each individual case, considered. In all cases of finance affecting a company the board makes a special study of all conditions bearing upon the matter, treating each case individually. The latitude afforded the commission by the laws makes it difficult to assign definite policies in advance.

A measure now before the Paris Council provides for a division of profits between the tramways and the city.

## COMMUNICATION

### THE PROBLEM OF REDUCING ACCIDENT DAMAGES

INDIANA UNION TRACTION COMPANY,  
ANDERSON, IND., Feb. 9, 1909.

To the Editors:

I have been following the series of articles published by your journal upon "The Problem of Reducing Accident Damages," by Frederick W. Johnson, with very great interest. Knowing something of Mr. Johnson's ability along this line, you certainly selected a most capable man to present this question to your readers. The result of this policy, as applied to the Philadelphia Rapid Transit Company, is also being watched with interest, and from results to date, Mr. Goshorn and Mr. Johnson should feel justly proud.

Many managers fail to see the importance and advantage of the proper instruction and education of the operating force from the very moment an applicant is considered. This is the time to begin to prevent accidents. These matters are dealt with much after the fashion of the servant girl who came into the kitchen and found the water flowing from the faucet onto the floor. She at once got the mop and bucket and began vigorously to mop up the water. The mistress, coming in, saw what was going on, and said, "Bridget, why don't you turn off the faucet?" Bridget replied, "Sure, mum, I've all I can do to keep the water off the floor."

Most companies very properly require new men to spend days, or even weeks, familiarizing themselves with the car equipment, how to handle cars, how to make temporary repairs, etc., and dismiss the question of handling and preventing accidents with but very slight attention, thus creating the impression upon the mind of the recruit that the accident feature is of little or no consequence. What little instruction is given is usually gone like a flash the moment an accident occurs, and the employee is thrust upon his own resources to do as he thinks best under the circumstances.

Suppose an emergency arises where it becomes necessary to place a green crew on a car. The motorman is told to "Keep on the schedule and not delay other cars;" the conductor, "Get your fares." They proceed on the run, their minds intent upon these last instructions. New conditions arise. The motorman gets a little nervous, but he wants to run the schedule, and he takes a chance, following the car in front too closely. The front car stops or checks to prevent striking a wagon crossing the track. The result, a rear-end collision. The cars are damaged to the extent of \$100 or \$200. A passenger or two may be killed; some broken limbs and other lesser injuries may result to passengers, involving personal injuries from \$10,000 to \$25,000. Passengers are in a panic; all want to get off the cars. The names of many are not secured. Designing persons may present fictitious claims, with favorable chances of the company settling. Which, then, becomes the more important, to "run the schedule" and take a chance, or to have had proper instruction and be ready to act in case of an emergency and properly handle the accident? Conductors and motormen are the men on the ground when the accidents occur, and it is of the utmost importance for them to understand just what to do in such an emergency.

Many times the first remedy (?) applied after a serious accident is to discharge the employee. He may have been, in a measure, to blame. He leaves the employ of the

company bitter against it, and will, if called upon to testify, put the worst version he can regarding the accident. A new man takes his place and the company takes the same chances with the new man, having to school him and run chances of his making mistakes. The discharged employee may later on get employment with some other company, which will get the benefit of all his previous training. No hard and fast rule can be laid down here, but certainly common sense and discretion should be used in such cases. Would it not be far better to administer discipline where infringements of rules occur and mistakes made that might have resulted disastrously and did not, and point out the dangers to the men, showing them what should have been done and benefiting from the experience, than to wait until after serious trouble arises and then apply the rod?

Constant vigilance upon the part of the head and sub-heads of the operating department is imperative in order that the cars may be properly handled, and in case of accident that the names of all witnesses and persons in interest on and off the car be secured. What does it matter if the cars are held five or ten minutes if a number of good witnesses can be secured, from which may be obtained the evidence necessary to defeat claims which are sure to follow? Five minutes' time lost is not to be compared with five good witnesses in presenting the facts of an accident to a court or jury.

Mr. Johnson is certainly working along correct lines, as well as others engaged in similar work. The idea of bringing the motormen and conductors together in classes for instruction is fine and productive of much good. A question box can be used to advantage. The men can be asked to jot down whatever they may wish to inquire about, drop the question in a box when they report, and before the class begins the questions can be assorted and classified and the important subjects given proper attention. Stereopticon slides can be used occasionally. The eye is a wider gateway than the ear to the brain. Meetings along similar lines can be had with employees of other departments, and a universal good fellowship fostered.

Claim departments have been at somewhat of a disadvantage in handling the matter of the instruction of employees regarding accidents. The operating department does not always take kindly to the even limited authority thus delegated to the claim department, a jealousy being created by the seeming encroachment upon the authority of the operating department, although in many cases it almost wholly ignores the matter of the instruction of employees regarding these questions. This is due partly from the fact that the time of the head of the operating department is largely occupied with other questions that to him seem more important.

The amounts paid out in damages occasioned by the operating department are not chargeable to that department, and it is only affected incidentally. If the items of damage caused by each department were charged directly to the department responsible therefor the head of each department would have an additional reason for keeping the expenses of his department as low as possible.

Claim departments are expected to effect a saving wherever possible in the adjustment of claims growing out of accidents, over which they rarely have any control. They are continually dealing with the vital questions concerning claims and their causes, and are in close touch with the employees concerned in them. This, if there are no

other reasons, should be sufficient for the larger companies placing at the head of the claim departments men of sufficient ability to handle claims, as well as to instruct the employees regarding accidents and their causes, with sufficient competent help furnished for this very important work.

Every claim department should keep records so as to enable it to determine the locality causing the most trouble, the kind of accidents occurring, their causes, etc., so as to be able to keep them in check by oral instructions, bulletins and otherwise. In all this work the claim department should deal with these matters in a way that will make those receiving instructions feel that they are co-laborers and all are working together for the general good of the company.

Local superintendents, being in direct charge of and coming in close touch with the men under them, should clearly understand the necessity and value of prompt, clear, intelligent reports and how to procure them, and when a man has failed in some particular to drop a word of help and caution, pointing out where the work can be improved. The accident and circumstances connected therewith are the things uppermost in the man's mind at the time the report is made, and suggestions made then will not be forgotten. Do not be afraid to give a word of praise for good work done. We are all human and like to know our work is appreciated.

These questions open a fruitful field for the Claim Agents' Association. Some phases of them have at times been up for discussion. Mr. Johnson has opened wide the door to this field. Let him who wishes enter.

ELLIS C. CARPENTER.

### FRACTIONAL FARE TRANSFER TICKET

John S. Alexander, of New York, has devised a fractional fare ticket system to cover cases where a transfer charge is made between connecting lines of the same railway or those of separate companies. It is intended to sell the tickets in strips of five for five cents. The passenger desiring a transfer gives the conductor one or more of these tickets in addition to the regular fare. In this way the passenger avoids the nuisance of carrying pennies for fractional fares and the companies secure a check on their conductors, as every transfer must be accounted for by a cancelled transfer-fare ticket.

### NEW CARS FOR THE METROPOLITAN STREET RAILWAY COMPANY, NEW YORK

The Dec. 5, 1908, issue of the ELECTRIC RAILWAY JOURNAL contained an extended description of the standard car which had just been adopted by the Metropolitan Street Railway Company, of New York. An order for 50 cars, which are of the pay-as-you-enter type, is now being completed by the Jewett Car Company, of Newark, Ohio. One of these cars as turned out by this builder is shown in the accompanying half-tone illustration.

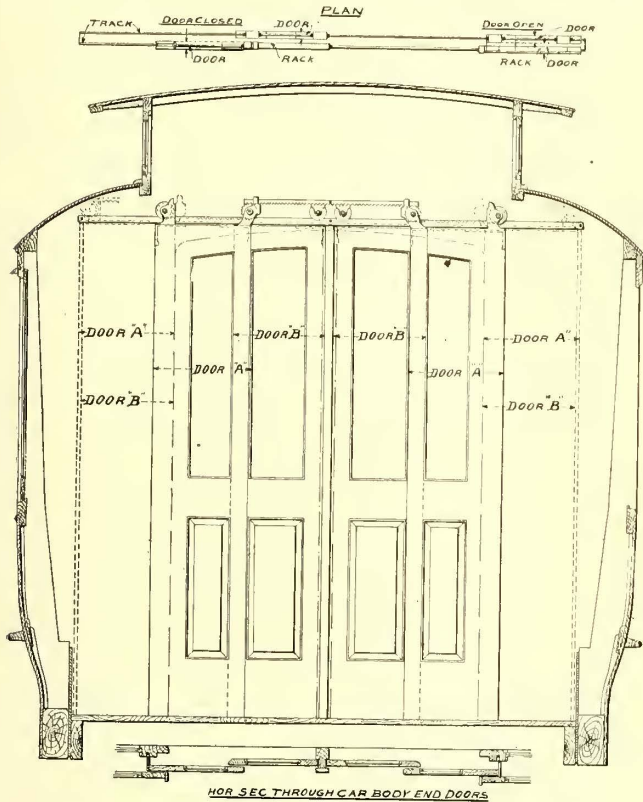
The car bodies have a number of novel features designed to meet the conditions of congested traffic in New York. They are 46 ft. 11 in. in length over all, 32 ft. over the body and posts and have 7-ft. 5½-in. platforms. The end bulkheads have a post in the center line of the doorway and have twin doors automatically actuated on either side of the post and which slide into pockets at each side of the car. The mechanism for these doors is so ar-

ranged that one door moves alongside of the other in the pocket, thus obtaining the maximum width of opening at the doorways. This door arrangement and mechanism, which is shown in the accompanying drawing, is covered by patents issued to W. S. Wright, president of the Jewett Car Company. A pipe railing extending from the central post to the step entrance separates the exit and entrance passenger. At the motorman's end the platform rail-

resembles very closely the old type to which the public has been accustomed for years, so there is little need for a campaign of education to familiarize the public with the new type. The car bodies are mounted on the Standard Motor Truck Company's maximum traction trucks.

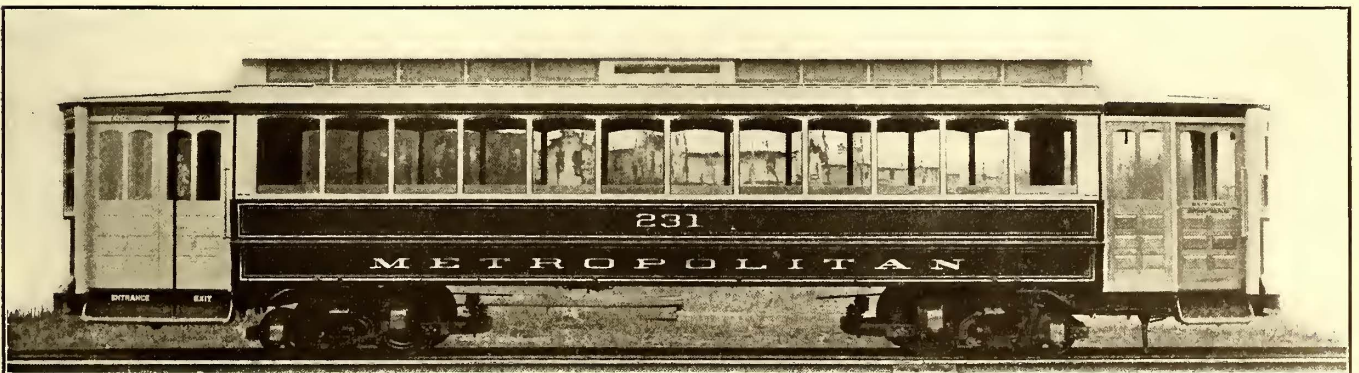
**THE DISPATCHING SIGNAL SYSTEM OF THE NEW BEDFORD & ONSET STREET RAILWAY COMPANY**

During the past seven years a system of dispatching signals has been developed on the New Bedford & Onset Street Railway Company's main line between Fairhaven and Wareham, Mass., under the patents and immediate supervision of Orlando W. Hart, of Fall River, Mass., with the co-operation of the officers of the railway company. On this typical single-track cross-country line, the signal system to be described below in its application has been thoroughly tried out and has enabled the traffic to be handled with the same flexibility which obtains on a steam railroad operated under the train order system. The method of use and rules governing the employment of the signal on the road were compiled by J. E. Marvelle, division superintendent of the New Bedford & Onset company. The signal system, which is called the "Dispatchagraph," was described in the *ELECTRIC RAILWAY JOURNAL* of Oct. 10, 1908, page 928. It consists essentially of a transmitter in the dispatcher's office, so connected with signal stations along the road that any car or train crew can be called up at any turnout or division point by the dispatcher, and instructed by telephone. The transmitter automatically calls the desired station after it has been set for the corresponding number of that station, receives and records on a strip of paper an accurate record of the whole operation, which, while it is in plain sight of the dispatcher, is beyond his control if desired, and is accessible only to the management of the road. The tape shows the date, time and number of the signal which has been set, with an automatic answer back of the signal number, which shows that it has been set as desired. When the signal has been set it is interlocked in the danger position by a mechanism at the signal station, and it cannot be restored to safety except by the authorized parties on account of a lock in the signal case. At each signal is installed a telephone which brings each car crew calling the dispatcher



Details of Double Sliding End Doors

ing is raised to the hood and thus is entirely out of the way. The platforms have a double folding-door at opposite corners. These doors are closed on the front end and are folded against the controller at the rear end of the car when in service. The opposite sides of the platform have small sliding doors under control of the motorman for exit passengers.



New Standard Car for Metropolitan Street Railway Company, New York

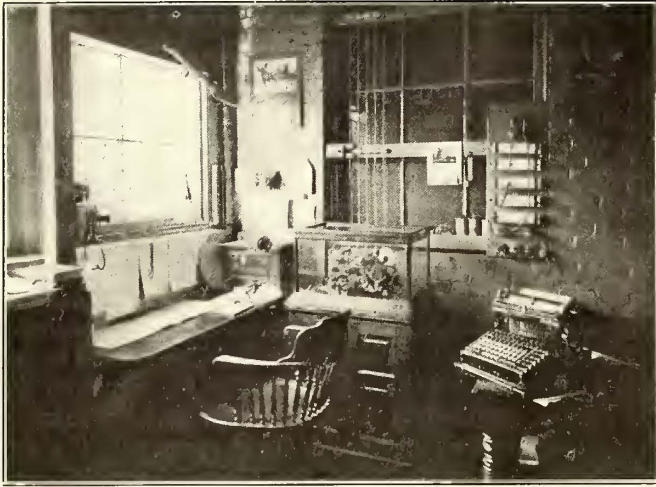
The seats are longitudinal and upholstered in rattan. At the ends of the car body they are set back 4 in. for a distance of one window, to give more room at the door openings. A folding seat and bench on each platform are installed for use on the forward end of the car; consequently there are no seats left out.

The interior arrangement and appearance of the car

into immediate communication with him. In case the signal is out of order the record indicates it either by the absence of the repeated number on the tape or, in case of a ground, a long dash is displayed on the record. The system is operated by trolley current with suitable resistances to cut down the voltage at necessary points.

The New Bedford & Onset installation consists of 15

signals of the enclosed disk type. The signals are all connected in multiple, which is a wide departure from the usual series connection of automatic and semi-automatic block signals, tending toward entirely independent service and increased reliability of transmission. The transmitter brings all the signals to the zero point before setting any



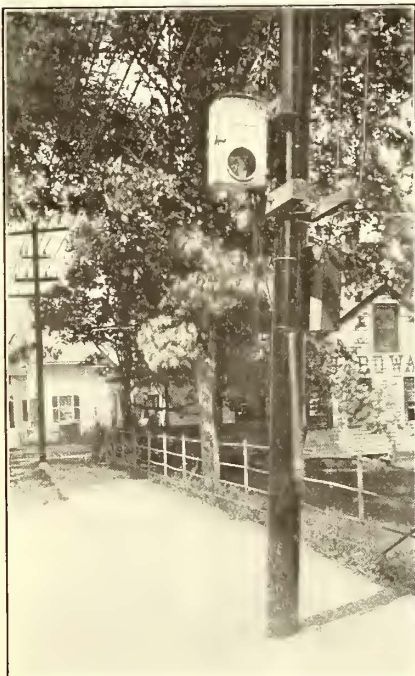
Dispatcher's Office at Wareham

particular one by automatic synchronous electrical impulses sent over the line, and after a signal has been set and mechanically locked in place the rest are brought to the neutral or zero point automatically. The date is shown by numbering the day of the year from 1 to 365. On the line of the Union Street Railway Company, of New Bedford, six similar signals of the semaphore type are to be installed soon, operating on the same principles as the disk

the New Bedford & Onset. The New Bedford & Onset line is normally operated from 5:30 a.m. to 12:30 a.m. A dispatcher is on duty 24 hours per day at Wareham, there being two 12-hour shifts. The usual headway between cars in each direction varies from 30 to 60 minutes, with a considerable extra traffic at certain seasons of the year. The company handles mail, express matter, and in the summer a large pleasure traffic. Since the signal system was first installed it has been considerably improved. But one wire, in addition to the two telephone wires, is necessarily installed for signal service. Simultaneous telephony and signaling are possible over the lines. The road is operated in the same way that it would be if stations were located at every siding, with an employee at these points, controlled by the Standard Steam Railroad Dispatching Code principles, with such minor modification as local traffic conditions require.

The New Bedford & Onset Railway is under the immediate jurisdiction of George P. Dole, superintendent, with J. E. Marvelle as assistant superintendent and chief train dispatcher, located at Wareham. Each side track of the road is designated as a station, each being given a name and number, both designations being necessarily given in all conversation and written matter relating to a specific siding. To illustrate, crew A, eastbound, and crew B, westbound, are due by schedule to meet at siding No. 4. Crew A become delayed by the drawbridge between New Bedford and station 1, call up and report themselves at station 1, over a certain number of minutes late, it being fixed by rule that any car becoming delayed over a certain number of minutes shall immediately notify the dispatcher, so that opposing cars may be moved up against the delayed car, thereby saving scheduled time to all others.

Crew A thus reporting themselves at No. 1 are given



Disk Signal Mounted on Pole



Car Crew Reporting at Signal

signals of the New Bedford & Onset. All parts are interchangeable by hand, and the selectors in the signal cases, which are actuated by the transmitter at the dispatcher's office, can be removed by hand complete, and similar ones instantly substituted without any tools whatever. Views of typical equipment are shown herewith in relation to

a train order in regular form to meet Crew B at No. 3; signal at No. 3 is usually set then as a clincher or safeguard against Crew A's forgetting their orders, should they arrive at No. 3 first. Immediately after giving the order at No. 1, the signal at No. 4 is set, and as soon as Crew B arrive at No. 4 they see the signal is down and

immediately call for orders, and are given the same order that was given to Crew A at No. 1; the first car arriving at No. 3 is told to restore signal and wait for the opposing car, reporting the same when it is in sight. By this method the cars are correctly reported to the dispatcher so that he knows exactly what sort of time they are running on. No car is allowed to wait over three minutes at a meeting point without reporting. Thus the company obtains correct reports of the departures of cars from meeting points when they are running late. In handling the express car, line car and construction service, the company runs them wild almost wholly, working them close up to the regulars' time entirely on the double train order principle, and saving large amounts of time that would otherwise have to be wasted in running properly clear of the schedule time of superior cars.

Another use to which the system is put is in the event of putting on special timetables for one day only, change of time, putting out or taking off half-hourly cars at a different hour than the established time, all of which makes either new meeting points at certain times or omits meeting points that have been made, this having been in the past cause for much confusion, delays, and on many roads bad collisions. Under such conditions as these the signal is set at such times and places as there is a chance for blunders by crews. In this way a careless man is caught on the verge of a mistake rather than depending on a fellow employee's report, or perhaps waiting until a blunder has been made before the fact is found out.

In the event of cars running as double headers, if the rear section becomes disabled or badly delayed, upon so reporting themselves to the dispatcher, the dispatcher first sets a signal ahead of the forward section, and orders them to wait, or back to clear the rear section of passengers, or drops off the rear section altogether, keeping all other cars on schedule time as conditions may require. The largest numbered signal can be set in 20 seconds. Within 5 minutes the dispatcher can call up every car on the single-track section of the road protected by the dispatchograph. On the New Bedford & Onset with the signals set often from one to three minutes in advance of the schedule time of a car at a certain point, it will detect and report the crew that may have left that point even 30 seconds before the signal was operated. When the dispatcher has reason to suspect a certain crew of violating the rule about running ahead of the schedule time without a train order permitting such occupation of the track, he picks out certain locations where the offence is believed to be committed and sets the signal ahead of such crews as he is looking up, anywhere from one-half minute to as much in advance of the time as his judgment dictates, and if no answer is received from the signal he knows at once that the crew in question have violated the rules by either running by the signal when at danger or by leaving the time point in advance of the schedule.

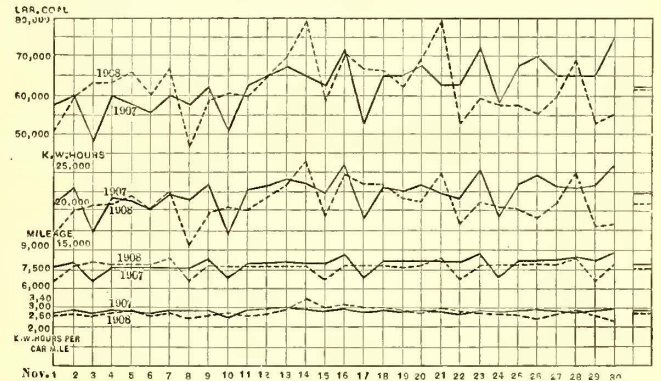
The system has proved of great value in the winter season. When, on account of heavy storms, some cars are withdrawn from the line, others are delayed, and snow plows are sent out, the schedule is always entirely upset, with the whole road practically running wild. The dispatcher's signal here affords accurate and reliable control of the entire situation. In certain cases where accidents have occurred to persons in the towns situated on the line, requiring an immediate rush trip to the hospitals in New Bedford, the signal system has enabled extra cars to be started promptly and given a right of way over all oppos-

ing cars, clear through to the end of the system. Mr. Marvelle has introduced a so-called "order signal," which is carried on the front of the car in the shape of a red flag by day and a red light by night, denoting that every car met or passed, whether at regular meeting points or at other sidings, must immediately call for orders, or if on a long siding or double-track section, at the first telephone reached, and positively before leaving the junction of the single or double track. After receiving an order signal the crew cannot proceed until they receive a telephone or written order. The system has also been utilized to a considerable extent in finding lost articles on cars.

Any signal can be cut out of circuit without disturbing the rest by pulling the fuses. The system is maintained by the dispatcher acting by telephone through a track employee or lineman. The interchangeability of the equipment has been a valuable feature on this road, which is too small to afford an elaborate engineering organization. The life of the parts has shown up well, the original contact brushes of the transmitter being still in regular service at Wareham. A signal station can be installed in about two weeks in good working order.

### POWER STATION RECORDS IN HARRISBURG

The accompanying diagram is a reproduction of the daily record curves prepared by the Central Pennsylvania Traction Company, of Harrisburg, Pa., to cover the operation of its power plant. There are four sets of curves, as follows: Kw-hours per car mile, mileage, kw-hours and pounds of coal. Each sheet has space for one month's operations compared with the same month of the preceding year. It will be seen from the totals and averages over the



Power Station Record of the Central Pennsylvania Traction Company

curves that the Harrisburg company suffered a reduction in kw-hours generated and mileage run owing to the hard times last year. This drop was accompanied by an increase in lb. coal per kw-hour from 2.81 to 2.94, and a loss of 4.4 per cent in the efficiency of the plant. The kw-hours are measured by separate wattmeters on each generator circuit. Line conditions improved during 1908, kw-hours per car mile dropping from 2.82 to 2.73.

By comparing the figures accompanying this curve sheet with those published in the Sept. 28, 1907, issue under the title "Low Power Costs in Harrisburg," it will be seen that this station continues to show unusually high efficiency. The generating equipment of the station consists of three 650-kw units, only two of which are in regular operation. The load factor, based on engine hours operated, is about 85 per cent. The coal used is Clearfield bituminous, which is rated at 14,800 b.t.u., and has an ash content of approximately 6 per cent.

# News of Electric Railways

## Cleveland Traction Situation

Judge L. E. Knappen, sitting on the United States Circuit Court bench at Cleveland last week at the request of Judge Tayler, heard arguments of counsel on the question of the expiration of the franchise on the Woodland Avenue and West Side lines. W. B. Sanders, of Squire, Sanders & Dempsey, attorney for the Cleveland Railway, and Newton D. Baker, city solicitor, for the city, presented arguments upon briefs which had already been filed. Mr. Sanders said that the consolidation of the Cleveland Cable Railway with the Woodland Avenue and West Side system in 1893, and three ordinances granted later, operated to extend the franchises of all the lines to Jan. 26, 1910, the date of the expiration of the grants to the Cleveland Cable Railway. He argued that while grants were given for the construction of the East Fifty-fifth Street crosstown line, which will expire in July, 1914, the companies were bound by contract to operate this line in connection with all the intersecting lines and interchange transfers with these lines until the expiration of the grant. Mr. Sanders stated that the grants of these intersecting lines were necessarily extended for the same length of time, as they could not otherwise be operated with the East Fifty-fifth Street line, according to the contract, and that the grant for this crosstown line affects all the intersecting lines on the East Side from Broadway to the lake. Mr. Sanders also argued that the extension of the Woodland Avenue line on Corwin Avenue in 1893 extended the time of the Woodland Avenue and West Side lines to Jan. 26, 1910, the original date of expiration being Feb. 10, 1908. The contract between the company and the city by which passengers were to be carried to any portion of the consolidated system, when the crosstown line received its grant, implied that all franchises should run to the latest date mentioned, so Mr. Sanders argued, as this is the only way in which the contract could be carried out.

Mr. Baker argued that the franchises on the Woodland Avenue and West Side lines all expired a year ago, and that the Forest City Railway had been given 3-cent grants over them, which were taken over by the Cleveland Railway when it purchased the property of the Forest City Railway, and that the Cleveland Railway can operate legally only according to the terms of those grants. He said that the case under contention is similar to the Central-Quincy case, decided by the United States Supreme Court against the company, and denied that any of the grants for extensions of tracks operated to lengthen the term of the old grants. To substantiate this claim he introduced several ordinances enacted for the purpose of extending franchises, and showed that they state their purpose specifically.

Mr. Sanders stated that he understood that the hearing was for the purpose of instructing the receivers in the rate of fare that should apply, and that it was not final. Mr. Baker contended that the hearing was final, and that the city will push it to a conclusion. It is understood that Judge Tayler will decide how the hearing shall affect the final disposition of the question.

The report of the receivers of the Cleveland Railway for January follows:

		Cents per car mile.
Gross earnings.....	\$382,043	19.06
Operating expenses:		
Maintenance .....	\$98,428	4.91
Transportation .....	179,548	8.96
General .....	34,109	1.70
Total .....	312,085	15.57
Net earnings.....	\$69,958	3.49
Deductions from earnings:		
Neutral street railway rental..	\$1,008	.06
Taxes .....	22,847	1.14
Interest rental.....	38,552	1.92
Dividend rental.....	73,378	3.66
Total .....	135,785	6.78
Deficit .....	\$65,827	3.29

This makes the total deficit for the nine months \$229,678, including the returns of the Municipal Traction Company during the time it operated the system. The statement for January is made in accordance with the terms of the lease.

Judge Tayler addressed the committee of the Chamber of Commerce on street railways a few days ago. The committee will not take any further steps toward the prepara-

tion of an ordinance until the developments indicate the necessity of the work.

## Chicago Railways Company's Rehabilitation Plans for 1909

The Chicago (Ill.) Railways Company plans to spend \$12,000,000 in rehabilitation work during 1909. It is expected that this will complete the schedule of improvement required by the ordinance and for which three years' time was allowed. The plan, therefore, contemplates finishing the work of three years in two. The \$12,000,000 available for this work will be used in rebuilding track, purchasing new pay-as-you-enter cars, erecting and improving car stations, machine shops and substations, etc. A summary of the rehabilitation work, including the new cars and buildings, as prepared by the engineering department of the company, follows:

112 miles of track, including special work.....	\$5,040,000
350 double-truck pay-as-you-enter cars.....	2,100,000
New underground system.....	1,282,893
Completing Lincoln and Wrightwood Avenues car station .....	81,000
"Limits" car station.....	192,530
Kedzie Avenue and Van Buren Street car station.	465,885
Twenty-second Street and Ogden Avenue car station .....	313,000
North and Forty-eighth Avenues car station....	457,750
Car shops.....	350,000
New rotaries for substations.....	450,000
New trolley construction.....	363,840
Total .....	\$11,996,988

Estimates for new construction include \$450,000 for increasing the rotary substation capacity, \$129,120 for renewing trolley and resetting 86.08 miles of poles and \$234,720 for 26.08 miles of extensions. Two million duct feet of underground tile conduit will be laid and 240 miles of high tension and feeder cables will be placed therein.

Work has already been started upon the "limits" car station, which will accommodate 89 double-truck cars, with clubroom facilities, stores and men's quarters. The Wrightwood and Lincoln Avenue car station, which will be completed this year, will accommodate 95 cars, the foundation for which has been started. The Kedzie Avenue station will accommodate 291 cars and the Twenty-second Street and Ogden Avenue station, work upon which has been started, will hold 214 of the large cars. The North and Forty-eighth Avenue car station will hold 360 double-truck cars. The car shops, which are to be extended, will have a sufficient capacity to take care of all the new double-truck cars to be placed in operation.

The new substation which is being erected at Lill Avenue, near Sheffield Avenue, was described in the ELECTRIC RAILWAY JOURNAL of Jan. 2, 1909, page 6. With the completion of this station the company will have four substations, with a converting capacity of 26,000 kw. The new units are of 2000 kw rated capacity each.

A little more than \$9,000,000 was expended by the Chicago Railways Company last year in reconstructing its lines, in the purchase of new cars, in erecting new buildings and other details of rehabilitation. Seventy-five miles of new track were rebuilt.

## Continued Hearing by Massachusetts Railroad Commission on Cambridge Subway Stations

The Massachusetts Railroad Commission continued on Feb. 10 the hearing on the petition of the Boston (Mass.) Elevated Railway for approval of its plans for the stations of the Cambridge subway. The hearing was largely devoted to the cross-examination of George A. Kimball, chief engineer of the Boston Elevated Railway, by City Solicitor Pevey of Cambridge. Mr. Kimball stated that in his opinion the convenience of the public was more important than the cost of the stations, and this had been borne in mind in making the designs. When the subway service is opened it is probable that the surface car service will be diminished somewhat. Such surface cars as are run through Harvard Square will have no difficulty in transferring passengers to and from the subway trains. Travel has been diverted from the Arlington-Harvard Square lines by the way of Sullivan Square terminal, as the Washington Street tunnel provides rapid transit through the business district by means of the connecting elevated lines.

Mr. Kimball pointed out that there would be no physical

connection between the subway train tracks and those for surface cars. Surface cars can be run through the tunnel if necessary. He then gave the detailed dimensions of the passageways for the Harvard Square station, showing that in all but one the grade is downward. The train platform inward bound would be 240 ft. long. The passageway from the Mt. Auburn car platform to the former would be 140 ft. long, on a 4.5 per cent grade. Outward bound, the Boston to Mt. Auburn passageway would be 200 ft. long, with a 10 per cent downgrade. The only passage with an upgrade would be from Arlington cars to the Boston train platform, grade 1.4 per cent. The Arlington passageways would be 140 ft. long, outward bound, and 165 ft. long, inward bound. Mr. Kimball emphasized the fact that while underground passageways are intrinsically undesirable, they are not objectionable here from the sanitary or police point of view, as they are designed without sharp turns, and in all but one case 14 ft. wide. They can be easily cleaned, and are not as complex as some of the existing passages in the Tremont Street subway. The estimated cost of the Harvard Square underground station, with the approach section of the subway from Quincy Square, Cambridge, westward, is about \$1,450,000.

**The Brill Report**

The annual report of The J. G. Brill Company, Philadelphia, was submitted by President Rawle to the stockholders at the annual meeting held at Philadelphia, Feb. 10, 1909. It is published below:

The output from the five plants owned and operated by The J. G. Brill Company for the 12 months ending Dec. 31, 1908, amounted to \$3,845,174.

For the purpose of comparison, the output for the three years, 1906, 1907 and 1908, was as follows:

	1906.	1907.	1908.
	\$6,908,346	\$9,211,826	\$3,845,174
After charging to repairs to buildings, machinery and tools the sum of \$125,503.91, the profit on the output for 1908, amounted to.....			\$188,830
From which has been set aside for depreciation.....			98,089
Leaving a net profit of.....			<u>\$90,741</u>

Which consists of profit earned in the manufacture of cars, trucks and sundry material.

As shown by my report of Feb. 12, 1908, your company had a large surplus or reserve and during the early portion of the last year, and, before it was demonstrated that it would be impossible to obtain more than a comparatively small amount of work for the year, the directors declared out of this surplus, on the common stock (in addition to the regular dividends on the preferred stock) one quarterly dividend of 1 per cent and two quarterly dividends each of one-half of 1 per cent.

The surplus account, as per my report of Feb. 12, 1908, showed a balance of.....	\$1,699,953
Less adjustment, interest and discount charges during the year.....	30,644
	<u>\$1,669,309</u>
To which must be added the profit for 1908.....	90,741

Leaving a surplus of.....	\$1,760,049
Less dividends paid during year:	
Preferred stock.....	\$320,600
Common stock.....	100,000
	<u>420,600</u>
Leaving a surplus on Dec. 31, 1908, of.....	<u>\$1,339,449</u>

At a directors' meeting held Jan. 27, 1909, the regular quarterly dividend on the preferred stock at the rate of 7 per cent per annum, amounting to \$80,150 was declared, which was paid Feb. 1, 1909. As shown above, a liberal amount has been expended for repairs and charged to operating expense, and the physical condition of the plants is excellent.

The great depression which prevailed during the year is reflected in the decreased output shown above as compared with the output of previous years. Insurance, depreciation and taxes are practically unchangeable, and it has been impossible greatly to reduce the other overhead expenses, making it necessary for this decreased output to stand nearly as much general expense as would have been borne by a normal output greatly in excess of that of 1908. It was impossible also to decrease the selling expense, but this rather increased by reason of the greater effort made necessary by the general condition of business.

During this year of unprecedented depression the financial condition of your company has been excellent, and the accumulated surplus, as above stated, has enabled the directors to pay during the year the dividends to which I have referred.

The outlook for work is much improved, although competition is still extremely keen. We have orders in hand as of Feb. 6, amounting to.....	\$1,717,338
Danville Car Company.....	78,277
Total.....	<u>\$1,795,615</u>

On April 1, 1908, a majority of the stock of the Danville Car Company, located at Danville, Ill., was acquired. This plant is now getting in a satisfactory running condition under the management of your company, and its output from April 1 to the end of the fiscal year amounted to \$98,036. After charging \$4,176 to repairs to buildings, machinery and tools, a profit was shown of \$5,655, from which a sum of \$4,237 has been set aside for depreciation, showing a slight net gain of \$1,418. As the entire stock of this company is not owned by The Brill Company, its accounts are not included in the combined statements submitted herewith.

On Nov. 29 we had a severe fire at the Brill plant, which destroyed a large amount of lumber, together with all the dry kilns, sheds for storing lumber and some small buildings. The entire loss, which was fully covered by insurance, amounted to \$176,872.83, and has been adjusted. New buildings to replace those destroyed are nearing completion, and the stock of lumber has been largely replaced.

The following is a condensed balance sheet as of Dec. 31, 1908, and also the condensed statement of the sales and expenditures for the year 1908, which show the total profits, together with the surplus, as of Dec. 31, 1908:

**THE J. G. BRILL COMPANY AND SUBSIDIARY COMPANIES  
COMBINED BALANCE SHEET, DEC. 31, 1908.**

ASSETS.	
Cost of properties.....	\$8,297,147
Material raw, in process and finished.....	1,510,216
Investments.....	69,267
Bills and accounts receivable.....	1,442,489
Cash.....	439,074
	<u>\$11,758,193</u>
LIABILITIES.	
Preferred stock.....	\$4,580,000
Common stock.....	5,000,000
Bonds (John Stephenson Company).....	400,000
Bills and accounts payable.....	438,743
Surplus.....	1,339,450
	<u>\$11,758,193</u>

**THE J. G. BRILL COMPANY AND SUBSIDIARY COMPANIES  
SALES AND EXPENDITURES FOR YEAR 1908.**

Total sales.....	\$3,845,173
Less operating, general and administration expense.....	3,656,343
Manufacturing profit.....	\$188,830
Less reserve for depreciation.....	98,089
Profit undistributed added to surplus.....	<u>\$90,741</u>
Surplus account from previous year.....	\$1,699,954
Less adjustment, interest and discount charges.....	30,645
Profit, as above.....	<u>\$1,669,309</u>
Less dividends paid during year.....	420,600
Total surplus.....	<u>\$1,339,449</u>

**Extension of Chicago Franchises Recommended**

The committee on local transportation of the Chicago City Council, which is noted in the ELECTRIC RAILWAY JOURNAL of Feb. 13, 1909, page 307, placed a valuation of \$788,784 on the property and franchises of the Chicago Southern Street Railway, has agreed to recommend an ordinance granting the company a franchise extension for 18 years on condition that it execute an operating agreement with the Chicago City Railway, by which the latter shall operate and rehabilitate the property. This agreement would be similar to that under which the Chicago City Railway operates the Calumet & South Chicago Railway, an abstract of which was presented in the ELECTRIC RAILWAY JOURNAL for July 4, 1908, page 214. In this case, however, the committee recommends the extension of the franchise for 18 years instead of 20 years, the term of the grant to the Chicago City Railway. It is stated that it will hereafter be the policy of the city authorities to grant all surface transportation franchises so that they shall terminate in 1927, in which year the present "partnership" franchises of the Chicago Railways and the Chicago City Railway expire. In the franchise proposed for the Chicago Southern Street railway, which was formerly known as the Chicago General Railway, the division of profits, 45 per cent for the railway and 55 per cent for the city, will be made a condition of the grant as in the other existing rehabilitation ordinances. The lines of the Chicago Southern Street Railway are in the west central part of the city within the terri-

tory served by the Chicago City Railway and the Chicago Railways.

The sub-committee of the Chicago City Council has also recommended for passage an ordinance providing for the extension of the Humboldt Park branch of the Metropolitan West Side Elevated Railroad. This extension will terminate at Seventy-second Avenue, the city limits. The route lies just north of North Avenue. Immediate construction is required by the ordinance, and it is stipulated that the company shall elevate the new track as far as North Fifty-first Avenue and to Seventy-second Avenue within seven years' time, at the city's demand. The Chicago & Oak Park Elevated Railroad is seeking a franchise for a line through the same territory, and it is stated that a new surface railway may be built into Chicago from the north which will use the new elevated structure for an entrance into the city.

**Cost Preparatory to Electrification of Illinois Central Railroad Into Chicago.**—Louis C. Fritch, assistant to the president of the Illinois Central Railroad, who was recently appointed consulting engineer of the company to supervise the preparation of plans for the electrification of the company's Chicago terminal, is reported to have made the following statement regarding the cost of the proposed work: "From the several preliminary plans for electrifying our terminals we estimate that the cost merely for changing our tracks for suburban and through passenger trains will approximate \$5,000,000 to \$6,000,000. As to the total cost, we have only a general idea at this time."

**Chicago Street Railway Rehabilitation.**—R. H. Rice, of the engineering staff of the Board of Supervising Engineers of Chicago Traction, delivered an address before the Armour Institute of Technology branch of the American Institute of Electrical Engineers on Feb. 10, on "Some Problems Connected with the Building of a Large Street Railway System." Mr. Rice described the methods used in calculating, constructing and erecting the various parts of the distribution and return circuits now being installed by the surface railways in Chicago, and called attention to the need in engineering calculations for full recognition of the financial side of any piece of construction work.

**Extension of New York-New Jersey Tunnel Sought in New York.**—The Hudson & Manhattan Railroad, which operates under the Hudson River from Hoboken, N. J., to Sixth Avenue and Twenty-third Street, New York, and which has under construction a tunnel under the Hudson River between Jersey City and Dey Street, New York, has applied to the Public Service Commission of the First District of New York for permission to extend the system to the new Grand Central Station, into which both the New York Central & Hudson River Railroad and the New York, New Haven & Hartford Railroad will operate. The extension will cost about \$5,000,000, and the company's engineers estimate that it can be completed within 18 months.

**Meeting of the Central Electric Accounting Conference.**—A call will be issued this week for a meeting of the Central Electric Accounting Conference, to be held at the Lima House, Lima, Ohio, on Saturday, March 6, 1909. At this meeting the committee on permanent organization will report and it will be decided whether the conference will be dissolved or a permanent organization effected. The committee on uniform interline blanks will make its report and will recommend for adoption uniform reports covering interline freight and passenger business, samples of the blanks having been printed and distributed to the members. The committee appointed at the last meeting to transmit requests for information concerning the new classification of accounts will report, and all questions concerning the operating revenues, operating expenses and expenditures for road and equipment, as provided by the Interstate Commerce Commission, will be discussed.

**Detroit Traction Committee Meets.**—The first public meeting of the committee of 50 citizens selected by Mayor Breitmeyer to consider the question of the terms of a new franchise to the Detroit United Railway was held on Feb. 4 in the Council chamber. Nearly all the speakers who were not members of the committee urged municipal ownership. Fred H. Warren, however, pointed out some of the fallacies of municipal ownership, and said that even if the citizens were overwhelmingly in favor of the plan to purchase the street railways, the city could not finance any such undertaking for many years on account of its financial condition. He urged that the committee present to the company for approval an ordinance providing for an extension until 1924 of the franchises which are to expire shortly. In 1924 the grants under which the 3-cent lines in Detroit are operated will terminate, and a blanket franchise could then be drawn covering the entire property or an alternative

proposal could be made to which the city might possibly be made a party.

**Improvements in St. Louis.**—Robert McCulloch, who has been elected president of the United Railways, St. Louis, Mo., says that the work of improvement begun last year, and on which about \$1,000,000 was expended, will be pushed as rapidly as finances will permit, and that during 1909 at least \$2,000,000 will be spent on new tracks and cars. Mr. McCulloch says: "I am satisfied with the test we have given the pay-as-you-enter cars and these shall be made general throughout the city. But the cars we propose to build will eliminate any disadvantages the present cars may have. They will have larger platforms back and front to avoid crowding and enable us to put into effect our original plan of permitting smoking only on the front platforms. We are not building any cars at present, but expect to begin soon. Times have been dull and that has deterred us somewhat. The need of extending the service not only to the northwest, but to other outlying districts has been recognized by the directors for some time, but it is impossible to say when we will be in a position to carry out the plan. We may begin the extension of the Bellefontaine line this year. It all depends upon our finances."

**Settlement of Paving Question in New Orleans.**—At a meeting of the finance committee of the City Council of New Orleans, held on Feb. 2, the ordinance recently offered for approval by certain councilmen providing for a compromise with the New Orleans Railway & Light Company regarding the cost of paving certain streets, and Prytania Street in particular, was favorably reported. Hugh McCloskey, president of the company, stated that the agreement was a result of a series of conferences held between the Mayor, the city attorney and representatives of the company. This compromise has received the approval of the directors of the company. In accordance with the terms of the ordinance, the New Orleans Railway & Light Company will bear the expense of the city's portion of the cost of paving between the tracks, and for 1 ft. on each side the tracks on Prytania Street from Louisiana Avenue to Joseph Street, on Joseph Street from Prytania to Hurst Street, and on Hurst Street from Joseph Street to Audubon Park, a distance of 2 1/3 miles. This work is to be begun during 1909, and pavement to the amount of \$75,000 must be laid before the end of 1909. The remainder of the work is to be performed continuously so that the whole pavement shall be laid on or before January, 1913.

## LEGISLATION AFFECTING ELECTRIC RAILWAYS

**Connecticut.**—A bill has been introduced to compel the Hartford & Springfield Street Railway to reduce the fare between Broadbrook and Warehouse Point, a distance of 4 1/4 miles, from 10 cents to 5 cents. Extensions are sought to the time for building the Meriden, Middleton & Guilford Electric Railway, the New Milford & Lake Waramaug Electric Railway and the Litchfield & Torrington Tramway. Another measure makes it unlawful for an electric railway company to transport any intoxicated person under penalty of \$10 fine for each offense, and extends police powers to motormen and conductors. A resolution has been introduced in the House providing that every electric railway shall issue a through ticket to each passenger to her or his destination; that fare limits shall be from the center of one town to the center of the next, and that fares shall not exceed 1 cent a mile. The measure has been referred to the committee on railroads.

**Illinois.**—A bill has been introduced which prohibits the issuance of free tickets, free passes, or free transportation by all railroad and railway companies, steam and electric. A fine of from \$100 to \$2,000 is provided for each violation.

**Indiana.**—The Matingly bill which increases and extends the authority of the Railroad Commission to telephones, electric light, gas and other public utilities has not yet been reported on by the Judiciary Committee of the Senate. A provision of the measure is that the commission shall appraise the "physical property and all growing and intangible values" of all public service corporations, but before determining the value finally it shall hold a public hearing on the case in question at which the representatives of the company shall be entitled to appeal from the decision of the board. The board may then, if it considers the objections valid, revalue the property. Every person, corporation and municipality coming within the provision of the act is required to file an annual statement of its earnings and its outstanding securities, etc., with the commission. Corporations securing franchise must obtain the consent of the commission before proceeding with construction work. All issues of stocks, bonds and notes must be approved by the commission. There must be no transfer of a franchise or of stocks or bonds of one company



to another without the approval of the commission. The Senate bill making it a penal offense punishable by a fine and imprisonment for an engineer or a motorman to take a crossing at grade where no interlocking plant is installed without stopping has been amended and reported favorably for passage.

**Massachusetts.**—As noted elsewhere in this issue, the New York, New Haven & Hartford Railroad has submitted to the Legislature its answer to the order making inquiry as to the manner in which it now holds the securities of the Boston & Maine Railroad and the several electric railroads in which it is interested in Massachusetts. By many, it is expected that the answer of the company will result in remedial legislation which will correct the present confusion, especially as the report of the Attorney-General declared that the State must do one of two things—formally approve the action of the company in holding the securities of the companies or declare its charter forfeited. The legislative committee on street railways gave a hearing on Feb. 9 on the petition of C. H. Blood for legislation to establish a board of railway commissioners having general supervision of street railway companies much the same as the Railroad Commission has over railroads, street railways, etc. Mr. Blood in contending for the appointment of a separate commission for the street railways, said the growth of the street railways and the railroads in Massachusetts made it quite impossible for one commission adequately to supervise both.

**New York.**—Members of the special rapid transit committee of the Chamber of Commerce of New York and members of the Public Service Commission of New York were in conference with Governor Hughes on Feb. 9, regarding transit conditions in New York. While it is understood that the question of legislation affecting street railway interests in New York was discussed, no formal statements were issued regarding the purport of the conference. A bill has been introduced to require the public service commissions to make public their decisions within 60 days after the evidence and arguments in a case are concluded. William M. Ivins, chairman of the New York City New Charter Commission, says that no date can be fixed for submitting the charter to the Legislature as there is no telling how long the committee of 15 will take in discussing it. The proposed changes in the charter will probably not be made public until such time as the charter is ready for report to the Legislature.

**Ohio.**—It is said that Governor Harmon does not favor the Woods public utilities bill now before the Legislature. The bill provides, among other things, that the tax commission created by the bill shall fix a system of accounting in accordance with which returns shall be made by the companies to the State.

**Pennsylvania.**—The Legislature will reconvene on Feb. 22. As final adjournment has been fixed for April 15, only eight weeks are left for the work in hand and to come. Of the measures affecting electric railway interests which have been introduced none has been reported from committee. One of the most important is that amending Section 14 of the act providing for the appointment of the State Railroad Commission, to read as follows: "The commission shall have power to recommend the manner under existing laws in which one railroad street railway, electric railway or other common carrier may cross another railroad, street railway, electric railway or public highways at grade or above or below grade and what safety appliances and regulations should be adopted at such crossings or at existing grade-crossings of railroads, street railways, electric railways or other common carriers with other railroads, street railways, electric railways and public highways for the protection of the public and the prevention of accidents. The commission shall also have power to recommend the form in which schedules or tariffs of rates, fares, charges and distribution of cars shall be posted and published, and make such change or changes therein from time to time as shall be found expedient." It is generally believed that the bill increasing the membership of the State Railroad Commission from three to seven will not be favorably reported by the Railroad Committee. A bill has been introduced in the Senate, which provides that employees of street railway companies shall not work more than 10 hours per day, and that these 10 hours shall all be within a period of the 12 hours. The most important measure so far proposed for introduction upon the reconvening of the Legislature is an act, drawn by the attorney for the Railroad Commission and Attorney-General Todd, carrying out the recommendation of the State Railroad Commission giving that body control of the capitalization of railroad, electric railway and other common carrier corporations. The bill will make operative a clause in the act creating the commission which gave it merely powers of inquiry.

# Financial and Corporate

## New York Stock and Money Market

February 16, 1909.

After several days of trading which gave promise of a revival of life, the stock market relapsed again to-day into the lagging, waiting condition that has been its marked characteristic for the last month. The losses were not great, and the falling off seems to be due more to lack of buyers than any eagerness to sell. There have been no developments in railroad or industrial affairs to influence trading. The condition is one of apathy. The outside public is not investing, the commission houses are doing no business, and the majority of the trading that appears is the small dealing of floor brokers. The decision of the Public Service Commission of the Second District of New York authorizing the Erie Railroad to issue \$30,000,000 of new bonds has had very little effect on the general market, but that little seems to be in the direction of depression. The rigid restrictions placed around the issue almost robs it of its value to the company, and practically serves notice on all other enterprises that every refinancing plan must be entirely beyond criticism.

Among the local traction securities there continues to be a fair amount of activity, considering the state of general business. Brooklyn Rapid Transit continues to be dealt in rather liberally, although prices have changed very little from those prevailing before the dividend announcement was made. Interborough-Metropolitan is more active than usual, and both issues, especially the preferred, have shown a disposition to advance moderately. Metropolitan Street Railway is almost out of the market.

The demand for bonds continues to be the surprising feature of the market. Every issue offered is largely over-subscribed. The new Burlington issue, which will be only \$15,000,000 instead of \$25,000,000, was extensively over-subscribed and was actively traded in on the Curb before the issue was made at 1 point above the underwriters' price. Call loans to-day were made at 2 to 2¼ per cent; 90 days at 2¾ per cent.

## Other Markets

Traction securities have been very little thought of in the Boston market during the week. Small and broken lots have constituted the entire business. Massachusetts Electric has been more active than the others and has recorded a fractional advance.

In the Philadelphia market, Philadelphia Rapid Transit continues to be the best seller among the tractions. The quotations are gradually advancing. There was no market to-day owing to the municipal election, but the price on Feb. 15 reached 28¾. Union Traction and Philadelphia Traction were both in the market to a limited extent at about the same figures that prevailed a week ago.

In Chicago the tractions are dull, even Subway and the various issues of the Chicago Railways being practically neglected. Only broken lots of these issues are being offered, and prices are about the same as previous figures.

In Baltimore the bonds of the United Railways Company continue to be active. Blocks of fair size change hands every day, but prices remain practically stationary. The "incomes" are quoted at 52 to 52¼, the 4s at 86 and the funding 5s at 79.

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

	Feb. 9.	Feb. 16.
American Railways Company, Philadelphia.....	*45	*45½
Boston Elevated Railway.....	129	129
Brooklyn Rapid Transit Company.....	71	72
Chicago City Railway.....	*185	*185
Cleveland Railway.....	—	—
Consolidated Traction Company of New Jersey.....	a74	a74
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a107	a107
Detroit United Railway.....	61½	*61½
Interborough-Metropolitan Company.....	16½	15½
Interborough-Metropolitan Company (preferred).....	43½	43½
Manhattan Railway.....	148½	a148½
Massachusetts Electric Companies (common).....	14¼	14¾
Massachusetts Electric Companies (preferred).....	69	68¾
Metropolitan West Side Elevated Railway, Chicago (common).....	*16	*16
Metropolitan West Side Elevated Railway, Chicago (preferred).....	*48	*48
Metropolitan Street Railway.....	*42	*42
North American Company.....	81½	81¾
Philadelphia Company, Pittsburg (common).....	*41¾	*42
Philadelphia Company, Pittsburg (preferred).....	44¼	*44¼
Philadelphia Rapid Transit Company.....	27¼	28¼
Philadelphia Traction Company.....	93	93
Public Service Corporation, 5 per cent collateral notes.....	a100	a100¼
Public Service Corporation certificates.....	a78	a78
Twin City Rapid Transit Company, Minneapolis, (common).....	104½	107
Union Traction Company, Philadelphia.....	53½	*53¾

a Asked. \*Last sale.

**Report of Metropolitan West Side Elevated Railroad**

The report of the directors of the Metropolitan West Side Elevated Railroad, Chicago, Ill., for the year ended Dec. 31, 1908, as presented at the annual meeting of the stockholders of the company on Feb. 1 compares with the previous year as follows:

	1908.	1907.
Income from operation.....	\$1,336,039	\$1,435,090
Interest on bank balances.....	1,014	1,216
Rental of outside property.....	4,982	4,523
Other income.....	4,130	1,080
<b>Gross income.....</b>	<b>\$1,346,165</b>	<b>\$1,441,909</b>
Interest first mortgage bonds.....	\$399,960	\$399,960
Interest extension mortgage bonds.....	151,304	125,622
Interest collateral loan.....	27,960	30,291
Interest equipment notes.....	8,643	18,817
Other interest.....	4,152	.....
Miscellaneous rentals.....	37,048	37,048
Loop rentals.....	257,947	261,995
Taxes, car licenses and special assessments....	197,735	176,390
<b>Total charges.....</b>	<b>\$1,084,750</b>	<b>\$1,050,123</b>
Available for dividends.....	\$261,415	\$391,785
Dividends declared.....	.....	195,927
<b>Balance carried to surplus.....</b>	<b>\$261,415</b>	<b>\$195,858</b>

**THE COMPARATIVE BALANCE SHEETS AS OF DEC. 31, 1907, AND DEC. 31, 1908, FOLLOW.**

	1908.	1907.
<b>ASSETS.</b>		
Cost of road, equipment and property.....	\$32,265,152	\$32,100,968
Capital stock in treasury, preferred.....	292,100	292,100
Capital stock in treasury, common.....	35,900	35,900
Extension mortgage bonds in treasury.....	983,000	1,179,000
Cash on hand and in banks.....	156,190	247,658
Material and supplies.....	52,321	77,644
Accounts receivable.....	62,020	47,700
Prepaid insurance.....	21,390	26,323
Advances, Union Consolidated Elevated Rail- road.....	53,720	53,720
Unadjusted accounts.....	15,232	78,984
	<b>\$33,937,025</b>	<b>\$34,139,997</b>
<b>LIABILITIES.</b>		
Capital stock preferred.....	\$9,000,000	\$9,000,000
Capital stock, common.....	7,500,000	7,500,000
First mortgage bonds, 4 per cent.....	10,000,000	10,000,000
Extension mortgage bonds, 4 per cent.....	5,000,000	4,500,000
Collateral loan.....	400,000	500,000
Equipment notes.....	.....	536,524
Notes payable.....	.....	73,722
Unpaid vouchers, payrolls and accounts.....	110,617	263,297
Interest coupons due, not presented.....	6,620	5,960
Interest on extension mortgage bonds, due Jan. 1.....	80,320	66,720
Dividend checks outstanding.....	241	474
Interest accrued, not due.....	171,650	173,681
Rentals accrued, not due.....	8,750	8,750
Taxes accrued, not due.....	101,873	101,873
Depreciation reserve.....	275,248	88,705
Balance surplus.....	1,281,706	1,320,291
	<b>\$33,937,025</b>	<b>\$34,139,997</b>

H. G. Hetzler, president of the company, in presenting the report, said:

"The mileage operated during the year has not been increased, being at this time 50.5 miles, exclusive of side tracks.

"The equipment, which consists of 225 motor cars, 183 coaches, 79 control coaches and 17 miscellaneous cars, has been maintained in first-class condition.

"The power house has been overhauled and put in thorough repair, thereby materially reducing the cost of operating.

"The terminal at Desplaines Avenue, on the Garfield Park Branch, has been enlarged, in order that the business to and from the Forest Park Amusement Park might be satisfactorily handled.

"The operating conditions on the Humboldt Park Branch have been improved by the installation of cross-over switches at Western Avenue, making it possible to store cars without blocking the station platforms or interfering with the traffic.

"The ties and guard rails on practically all of the curved track have been renewed, and continuous rail joints have been installed over the entire system, replacing angle bars, and greatly improving track conditions.

"Safety of operation has been increased by the use of a spacing signal system over the entire road and the installation of safety stop apparatus at the river bridge and at all junction points. The public has been advised of the adoption of these safety devices by an illustrated circular issued by the company.

"The feeder system on the Logan Square and Humboldt Park Branches, and between the power house and Marshfield Avenue on the main line has been entirely remodeled and greatly improved. The return circuit on the entire system has also been improved."

**New York, New Haven & Hartford Railroad Replies to Massachusetts Legislature**

The reply of the New York, New Haven & Hartford Railroad to the questions asked by the Legislature of Massachusetts regarding the company's interest in the Boston & Maine Railroad and its holdings of the securities of several street railway companies in Massachusetts was made public on Feb. 16. The company concludes:

"We understand it to be now contended by the Legislature that the recent decision of the court should be interpreted as holding that the company, instead of being a corporation of each of three States, and at least entitled to exercise within the State which originally chartered it, the powers granted to it by that State, is one corporation in all three States, and is authorized to exercise no powers in any instance, except as such powers may happen to be conferred concurrently by all three States.

"We do not so understand the decision made. If such, however, be the law, it will appear to any one that the situation of the company must be changed by legislation somewhere; for a doctrine that a legal person is, as to every act at the same time, subject to three different and perhaps radically divergent and antagonistic sets of laws, is incapable of practical application.

"The railroads owned by the New York, New Haven & Hartford Railroad Company are situated in Connecticut, Rhode Island, New York and Massachusetts. Much the largest part of this railroad is in Connecticut and only a relatively small portion of it is situated in Massachusetts.

"The New York, New Haven & Hartford Railroad Company was originally a corporation chartered only by Connecticut under the name of the New York & New Haven Railroad Company. Into this Connecticut corporation was merged, in 1872, the Hartford & New Haven Railroad Company, chartered by Connecticut and also by Massachusetts, about 6 miles of its railroad being situated in Massachusetts.

"By an act of 1872 Massachusetts consented to this merger and declared that as to its railroad the company should be subject as before to the laws of Massachusetts, but it was at the same time substantially declared that as to its charter the consolidated corporation was to be 'subject to the charter' of the purely Connecticut corporation.

"Since 1872 the company has again and again acted under the authority of Connecticut law without authority from Massachusetts. Most, if not all, of these acts were reported to the authorities of Massachusetts, and although the laws applicable to this matter seem to have been for many years substantially the same, no question was, until recently, raised by anyone as to the legality of these acts.

"In conclusion, the company respectfully submits that its true interests and those of the people of Massachusetts are identical, and that, while it will always endeavor to comply with such laws as Massachusetts may choose to enact, the welfare and prosperity, both of the Commonwealth and of the company, require that the legislation of the Commonwealth shall not impair but shall strengthen the company's ability to provide the public with all needed transportation facilities and advantages."

**Earnings of Chicago City Railway**

The Chicago City Railway reports the following earnings for the 11 months ended Dec. 31, 1908, compared with same period of 1907:

	1908.	1907.
Passenger earnings.....	\$7,657,102	\$7,460,702
Other income.....	160,876	101,992
	<b>\$7,817,978</b>	<b>\$7,562,694</b>
Operating expenses 70 per cent of gross earnings, as per ordinance requirements.....	5,472,585	5,293,886
Balance.....	\$2,345,393	\$2,268,808
Interest allowance, 5 per cent.....	1,463,089	1,116,387
Net earnings.....	\$882,304	\$1,152,421
City of Chicago, 55 per cent.....	485,267	633,832
Chicago City Railway, 45 per cent.....	397,037	518,589

**Blue Ridge Traction Company, Danielsville, Pa.**—The Blue Ridge Traction Company recently elected the following officers: J. K. Horver, president; H. H. Horver, secretary; C. C. Marsh, treasurer and superintendent; C. C. Marsh, J. K. Horver, Henry H. Horver, George T. Opfinger, James L. Foote, J. S. Mayer, directors.

**Chicago (Ill) Railways Company.**—N. W. Harris & Company and the National City Bank, New York, are offering at 101 and accrued interest, the \$6,000,000 Chicago Railways Company first mortgage 5 per cent bonds recently purchased by them.

**Chicago & Milwaukee Electric Railroad, Chicago, Ill.**—A bill asking that the \$4,000,000 bond issue of the Chicago & Milwaukee Electric Railroad maturing in 1920, be foreclosed on the ground that the Illinois corporation is insolvent, has been filed in the United States Circuit Court at Chicago. The petitioner is the Merchants' Loan & Trust Company, trustee under certain trust deeds from the company.

**Easton (Pa.) Transit Company.**—Governor Stuart of Pennsylvania has approved the consolidation of the Easton Transit Company and the Easton & South Bethlehem Transit Company. The Easton Transit Company now operates the property of the Easton & South Bethlehem Transit Company under lease.

**Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.**—The stockholders of the Fonda, Johnstown & Gloversville Railroad at a meeting on Feb. 10 authorized an increase in the capital stock of the company from \$2,500,000 to \$3,500,000.

**Ft. Wayne & Springfield Railway, Decatur, Ind.**—A semi-annual dividend of 2 per cent has been declared by the directors of the Ft. Wayne & Springfield Railway. The directors have pledged themselves to dispose of \$100,000 worth of stock by May 1, 1909, the proceeds from which will be used to build an extension to Berne. Mention of this possible extension has previously been made in the *ELECTRIC RAILWAY JOURNAL*.

**Newport News & Old Point Railway & Electric Company, Newport News, Va.**—In the *ELECTRIC RAILWAY JOURNAL* of Feb. 13, page 307, mention was made of the application by the Maryland Trust Company, Baltimore, Md., trustee under the \$4,000,000 general mortgage of the Newport News & Old Point Railway & Electric Company, for the appointment of a receiver for the Newport News & Old Point Railway & Electric Company. Alexander Brown & Sons, Baltimore, and Brown Brothers Company, New York, have since then issued a call for deposits of the general mortgage bonds. They have made the following statement: "We have been informed that the board of directors of the Citizens' Railway, Light & Power Company, without the knowledge of the Maryland Trust Company, has purchased \$300,000 common stock of the Newport News & Old Point Railway & Electric Company and has issued its note for \$120,000 therefor. The same time the Danville Railway & Electric Company has purchased \$250,000 of the common stock of the Newport News & Old Point Railway & Electric Company, and has issued its note for \$100,000 therefor. We are advised that if these transactions are permitted to stand, they will, to the extent of the said note, impair the interests of the general mortgage bonds. We have therefore requested the Maryland Trust Company to take such action as it may deem advisable to protect the interests of the general mortgage bondholders. While the company has not defaulted in interest payment on the bonds, we believe it desirable that all holders of the general mortgage bonds promptly deposit the same with us, particularly in view of the fact that the management, which is responsible for the action claims to represent personally a large block of these bonds."

**Northwestern Elevated Railroad, Chicago, Ill.**—A committee said to be composed of Ira M. Cohe, vice-president of the Assets Realization Company, Samuel Insull, president of the Commonwealth Edison Company, and Emile K. Boisot, vice-president of the First Trust & Savings Bank, is reported to have been selected to perfect a plan for merging the elevated railways in Chicago. A plan under consideration is said to provide for the leasing of both the South Side Elevated Railway and the Metropolitan West Side Elevated Railway by the Northwestern Elevated Railroad.

**Taunton & Pawtucket Street Railway, Taunton, Mass.**—The coupons due on Jan. 1, 1909, on the \$2,000,000 of first mortgage 5 per cent bonds of the Bristol County Street Railway were not paid at maturity. The Federal Trust Company, Boston, Mass., is trustee of the mortgage securing the bonds, and it is expected that a statement will be made to the bondholders very soon.

**United Railroads of San Francisco, San Francisco, Cal.**—The United Railroads of San Francisco has declared out of the earnings of the six months ended Jan. 1, 1909, an initial dividend of 3½ per cent, which is at the rating of 7 per cent per annum on the \$5,000,000 of 7 per cent cumulative first preferred stock. The dividend is payable on Feb. 15.

**Youngstown & Ohio River Railroad, Youngstown, Ohio.**—At the annual meeting of the directors of the Youngstown & Ohio River Railroad officers were re-elected as follows: R. F. Dennison, president; W. B. Whiting, vice-president; F. S. Whitcomb, secretary-treasurer; C. S. Thrasher, general manager.

## Traffic and Transportation

### Accident Swindler Attempts to Break Jail

Through what is alleged to have been an attempted jail delivery from the Tombs Prison, New York, on Feb. 10, there was brought to light the criminal record of Howard Remington Mercer, a well-known accident fraud swindler. Mercer, or Remington as he is known in some cities, was under indictment for grand larceny for defrauding the New York City Railway out of \$4,000 on a fake accident case. It is alleged that Joseph A. Shay, a lawyer, and Walter F. Peck, alias Williamson, who was employed by Shay as an "investigator" or in other words as an "ambulance chaser," conspired to smuggle into the prison a disguise for Mercer and had an automobile outside in waiting which was to have taken him out of the city. The district attorney's office received information of the attempted jail delivery in time to frustrate the plan and the arrest of Shay and Peck followed. Shay was held in \$5,000 bail after both Mercer and Peck, it is alleged, had confessed the details of the plot and had implicated Shay in their affidavits as a principal.

On Feb. 13, 1902, Harry R. Mercer was arrested in Philadelphia as a fugitive from justice from St. Louis, where he was wanted on a charge of larceny of typewriters. On March 19, 1902, he was discharged in the Court of Criminal Correction, of St. Louis, on two charges of grand larceny and was turned over to the police of Kansas City, Mo., being wanted in that city for stealing typewriters. In July, 1902, he was convicted and sentenced to four years in the penitentiary of Jefferson City, Mo. He was discharged under the three-fourths law on July 17, 1905. His register number was 5127. Theodore Mercer was arrested in Chicago Aug. 15, 1901, as a fugitive and taken back to St. Louis, where he was wanted for the theft of typewriters, and on Sept. 20, 1901, in the Court of Criminal Correction, of St. Louis, he pleaded guilty to petty larceny and was sentenced to six months in the workhouse. He was later transferred to the city hospital, from which place he escaped Jan. 21, 1902. He was wanted in Kansas City, Mo., at the time of his escape. Harry and Theodore Mercer are said to have dressed as priests in order to make the renting of typewriters easy, and they rented these typewriters under the pretence of writing sermons.

In 1906 Harry Mercer came to Philadelphia, where he opened up an office and styled himself "a public claim adjuster," and while in this city he was associated with his brother, Edgar Mercer. On Jan. 5, 1907, the Mercers brought an action against the Philadelphia Rapid Transit Company for \$30,000 damages through one Carl O. F. Nordlander. Nordlander was a faker of accident claims with a national reputation. He was arrested, tried and convicted in Philadelphia on the charge of conspiracy and attempted false pretence and was sentenced to three years in the county prison, where he died. Warrants were issued for the arrest of Harry and Edgar Mercer, charging them with conspiracy and attempted false pretence in connection with the Nordlander case. Harry Mercer left the jurisdiction of the Pennsylvania courts and has since been a fugitive. Edgar Mercer was arrested and is at the present time under indictment in Philadelphia.

After Harry Mercer left Philadelphia he is said to have gone to Colorado. Some time later he returned to New York City with his brothers, Theodore and Elwood and, under the names of Harry, Theodore and Elwood Remington, it is alleged, they associated themselves with a man by the name of S. S. Stagg, on Second Avenue, New York City, at which address Stagg had carried on the artificial limb business for years. Stagg was supposed to have been in constant touch with the secretaries of relief associations of large corporations, and in this way would be advised when an accident occurred resulting in amputation, and while endeavoring to sell the injured person a leg or an arm, it is claimed he would induce them to bring an action against the company responsible for the accident. Through this channel he had the means of obtaining inside information. On Dec. 28, 1908, Harry and Theodore Mercer presented a release to the receivers of the New York City Railway Company for \$4,000. This was in settlement of the claim of a young girl named Heister, who had lost a leg as a result of an accident on a Third Avenue surface car. After securing this money Harry and Theodore and their families left New York City, came to Philadelphia and then went to San Francisco, Cal., where they were arrested within 48 hours after their arrival. They were returned to New York City, where Harry Mercer is said to have made a full confession of his various transactions with various lawyers throughout the country. Among the cases alleged to have been mentioned by Harry Mercer

in his confession as being fraudulent was the case of Carri-gan against the receivers of the New York City Railway Company, in which a verdict of \$10,400 was recently obtained. Mercer, it is claimed, described the crookedness of this case and showed where perjury had been committed by two of the principal witnesses; these witnesses have since been arrested. One is still confined in the Tombs. He has made a complete confession of guilt and the other witness has been paroled in the custody of a detective. Mercer in his confession also cited in detail a case against the United Railways, of Albany, N. Y., in which a large verdict was secured on testimony that was bolstered up. In his statement Mercer is alleged to have implicated Attorney Joseph A. Shay as being associated with him in the above mentioned cases.

The "Amputation Bureau" conducted by Stagg and the Mercers on Second Avenue, is said to have made a practice for some time past of removing claimants to a place where those interested cannot get in touch with them. At the present time it is claimed a man by the name of John Ossino, who has a claim against the Pennsylvania Railroad Company in an action to recover for the loss of both legs, is an inmate of the house. He has entered suit for \$100,000, and has been confined in the basement of the "Bureau" since July, 1908.

A detainer has been lodged against Mercer by the Philadelphia Rapid Transit Company charging him with conspiracy on the \$30,000 case of Carl O. F. Norlander.

#### Massachusetts Commission Issues Decision in Lawrence & Methuen Street Railway Fare Case

Under date of Feb. 10 the Massachusetts Railroad Commission issued the following order relative to fares on the Lawrence & Methuen Street Railway:

"Certain residents of Methuen allege that a fare of 8 cents on the Lawrence & Methuen Street Railway is excessive and unreasonable.

"The company operates from Lawrence through Methuen to the Haverhill boundary, from Lawrence through Methuen to the New Hampshire boundary at the town of Salem, and from Lawrence through Methuen to the New Hampshire boundary in the town of Pelham. The rates of fare upon these three lines are as follows: From Lawrence to the Haverhill boundary, 5 cents; from Lawrence to the Salem boundary, 5 cents; from Lawrence to the Pelham boundary, 8 cents. The mileage of the three lines is substantially the same.

"A careful examination and study of its annual returns and financial condition indicate that the company might be justified in making an increase in its charges for transportation, if reasonable, and as far as possible distributed over all its lines. This question is not before us and we therefore do not decide it. The company, however, has arbitrarily selected one division of its system and advanced the rate from 5 cents to 8 cents. This, in our opinion, is unfair to a portion of the traveling public, for it creates a burden that bears unduly upon them. If the fares upon all lines of this company were reasonably advanced, it would appear that an increase in gross earnings could be secured by a rate upon this division of less than 8 cents. It must therefore follow that the 8-cent charge is excessive and unreasonable, and we recommend a reduction."

#### Decision Favorable to Company in Haverhill Fare Case

The Massachusetts Railroad Commission issued a decision under date of Feb. 10, sustaining the Haverhill & Southern New Hampshire Street Railway for the present in charging a 6-cent fare between Haverhill and Ayer's Village. A petition had been presented by the Mayor of Haverhill for a reduction to 5 cents. The board says:

"The Haverhill & Southern New Hampshire Street Railway, operating in Haverhill, has recently raised the fare from 5 to 6 cents for a continuous ride from the center of Haverhill to the New Hampshire State line.

"Complaint is made that the fare now established between the city proper and Ayer's Village is excessive and unreasonable. This village is in Haverhill, between the center of the city and the New Hampshire State line and is more than 5 miles from Haverhill Square.

"The board has adopted in this case its usual method of requiring comparative daily returns of income to be submitted by the company, and after careful examination of these returns, in connection with a study of the financial condition of the company, is unable to say that the fare is excessive and unreasonable.

"In view of a suggestion made at the hearing, of the company's intention to re-establish a 5-cent fare between Hav-

erhill Square and the New Hampshire boundary during the season of summer riding, it may well be that if this fare is reinstated conditions may be created that may occasion further action by the board, and the petition is therefore dismissed without prejudice."

#### Side-Door Train in the New York Subway

The first of the eight-car side-door trains for the New York subway, providing separate entrances and exits, was placed in operation on Feb. 16. After several preliminary trips, the train was started from the Atlantic Avenue station in Brooklyn during the rush hours for carrying passengers. The time consumed at stations during the first trips is said to have been somewhat longer than that for the regular express trains, but this is explained by the newness of the equipment and the inability of the public and the employees of the company quickly to adjust themselves to the changed conditions.

This experimental side-door train was equipped at the shops of the Interborough Rapid Transit Company in accordance with a recommendation made by B. J. Arnold, consulting engineer to the Public Service Commission of the First District of New York. An extended abstract of the report and plans of the car were published in the STREET RAILWAY JOURNAL for Feb. 29, 1908. Soon after the presentation of that report the Public Service Commission requested the Interborough Rapid Transit Company to change over 16 cars to this design to test the desirability of the plan.

Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, when requested to express an opinion for publication as to the practicability of the car for New York subway conditions, declined to do so. Mr. Arnold said:

"As Mr. Hedley has contended ever since this type of car was proposed that it would be unsuccessful, and I have contended that it would be successful and desirable, I assume that neither of us will be considered an unbiased judge as to its success in operation. Consequently, the little pleasantries which the newspapers have reported as having occurred between us during the operation of the cars are not to be taken seriously. I think, however, that the public will appreciate the difficulties encountered by the Public Service Commission and its assistants in operating, simultaneously with many other trains, a single train diametrically opposed to the methods used on all of the other trains and with men inexperienced in its operation, whose efforts would naturally be somewhat influenced by the attitude of their superiors toward the innovation.

"As it is evident that the position that additional doors in a car will not increase its loading and unloading facilities cannot at present be sustained, the chief difference between Mr. Hedley and myself has narrowed down to the method of operating the car. He contends that passengers should be allowed to enter and leave through both doors and thus, in my judgment, maintain the same conflicting condition that exists during the rush hours with the present cars, while I contend that the new cars will permit the circulation of passengers in one door and out the other, if the instructions which I have given for operating the cars are enforced, and especially will this be the case as soon as the public and the railroad employees become accustomed to them. Furthermore, the new design will enable passengers to enter and leave the cars much more comfortably than is now possible with the present type of car having the single doors at each end.

"I also believe that the new cars will greatly decrease the station waits and therefore increase the capacity of the subway, provided the entire subway system is equipped with these cars and the facilities and conditions are made suitable for their operation, which is not the case at present.

"My contention, in answer to Mr. Hedley's statement to the effect that the guards cannot see the new doors and therefore cannot operate them properly, is that during the light hours of traffic the train guards can see the doors, and during the rush hours the platform guards should assist the train guards in operating the new doors, the same as they now assist in operating the doors of the old cars.

"If it is proved that the train guards cannot see the new doors well enough at all times as the cars are now arranged, these doors can easily be made visible at all times by providing the bulkheads, which are now solid, with glass, or by the introduction of mirrors, as is sometimes done on locomotives to enable the driver to see the rear of the train without looking backward.

"The side door, has, in my judgment, come to stay. I believe that as soon as the people become a little more familiar with it they will support my contention."

**New Jersey Company Seeks Freight Rights.**—The Burlington County Railway, Mt. Holly, N. J., has applied to the Township Committee of Mt. Holly for permission to carry freight. Under the present law in New Jersey providing for the granting of freight rights to electric railways, the different towns through which a company operates must grant uniform terms before a company can carry freight.

**Employees' Tickets in Springfield, Mass.**—The employees of the Springfield (Mass.) Street Railway are to be given cards calling for 100 rides to be used by them in traveling on the company's lines when they are not in uniform. The cards will be good for a period of three months and will be punched by the conductor every time they are offered to identify an employee. Conductors are to be instructed to enter the number of the card presented to them on their day sheet when making returns to the company.

**Claim Adjuster Sentenced for Forgery in New York.**—Carl H. Schwartz, a claim adjuster for the Metropolitan Street Railway, has been sentenced to serve not less than six years and not more than seven years and ten months at hard labor in Sing Sing by Judge Malone in Part I, General Sessions. The defendant had pleaded guilty to forgery. While in the employ of the Metropolitan Street Railway he secured two releases for \$10, but when the vouchers were presented to the company's cashier they read for \$60.

**Crusade Against Spitting in New York.**—Finding that the public was again growing lax in its observance of the law against spitting in public conveyances, the Board of Health of New York on Feb. 9 began a crusade against spitters, which resulted in the arrest of 200 men on the first day. Dr. Bensel, city sanitary superintendent, has detailed 44 special policemen from his department to patrol the street railway lines, for the time being at least. They will work in each of the boroughs of New York on different days. The men arrested on Feb. 9 were fined from 50 cents to \$2 each.

**Increase in Service on Crosstown Line in New York.**—The Public Service Commission of the First District of New York adopted a final order on Feb. 9 requiring the receivers of the Metropolitan Street Railway to increase the service on the Fourteenth Street and Williamsburg Bridge crosstown line. The order requires that at rush hours a minimum of 25 cars must be run past a given point in 15 minutes, the same to be in effect by Feb. 15. By March 15 this minimum is to be increased to 30. The receivers are furthermore required to report on each Monday the condition of the traffic during the previous week. The reason for not requiring a minimum of 30 cars on Feb. 15 is the statement of the receivers that a heavier feeder must be installed before the proposed increase is put into effect.

**Hearing on the Service of the Second Avenue Railroad, New York.**—A public hearing was held by the Public Service Commission of the First District of New York, on Feb. 15, on the service of the Second Avenue Railroad. George Linch, the receiver of the company, said that he had done the best he could with the facilities at his command to repair and put into service the equipment turned over to him, and that plans were being considered for the construction of a new car barn. The summer equipment of the company, he said, would be ready for operation by May 31. After the hearing, Commissioner Maltbie intimated that in view of the conditions under which Mr. Linch had worked it would only be fair to him to mitigate the order of the commission requiring that 100 cars be thoroughly overhauled.

**Another Accident Fakir Apprehended in Baltimore.**—George W. Tragesser, Jr., Baltimore, Md., was arrested on Feb. 10 by Wm. M. Atkinson, of the Baltimore police force and Jos. J. Gilbert, special agent of the United Railways & Electric Company, Baltimore, charged with attempting to defraud the United Railways & Electric Company by means of false representation. Tragesser claimed to have been injured in a collision between two cars on Jan. 30, 1909. Investigation developed that Tragesser was not on either car nor was he in the locality where the collision occurred. He read an account of the accident in the newspapers the day following the accident and with the information which he had procured in this way was able to describe minutely how the accident took place and the damage done. The genuineness of his claim first came into question when Tragesser stated that he dipped his handkerchief in a stream of water nearby and washed the blood from his face. As a matter of fact, it was cold and dry on Feb. 10 in Baltimore, and there was no running water near the point where the collision took place. He confessed when arrested. Justice Grannan at the Central Police Station committed Tragesser for the action of the Grand Jury in default of \$1,000 bail.

## Personal Mention

Mr. William L. McCurdy has been elected president of the Evansville (Ind.) Railways Company.

Mr. T. F. Wickham has been elected treasurer of the Helena Light & Railway Company, Helena, Mont., to succeed Mr. G. W. Bunnell, Jr.

Mr. Sterling T. Dow has resigned as freight agent of the Maine Central Railroad at Bangor, Me., to become assistant treasurer of the Atlantic Shore Line, Kennebunkport, Me.

Mr. John M. Wilson has retired as chairman of the District Electric Railway Commission of Washington, D. C., and Mr. Henry L. West of the commission has been appointed to succeed him.

Mr. John Murphy, general superintendent of the Pittsburgh (Pa.) Railways Company, has been appointed assistant to Mr. James D. Callery, president of the company. Mr. Murphy has been connected with the Pittsburg Railways Company for 18 years.

Mr. P. N. Jones, electrical and mechanical engineer of the Pittsburgh (Pa.) Railways Company, has been appointed general superintendent of the company to succeed Mr. John Murphy, who has been appointed assistant to Mr. James D. Callery, president of the company.

Prof. Harold B. Smith, professor of electrical engineering, Worcester Polytechnic Institute, has been placed in nomination for a managership in the American Institute of Electrical Engineers. Professor Smith is indorsed for this nomination by Profs. Joseph O. Phelon and Albert S. Richey and by Messrs. Carl D. Knight, Francis J. Adams, Albert T. Childs and Walter D. Stearns.

Mr. Chester P. Wilson, who recently resigned as superintendent and purchasing agent of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., to become general manager of the Des Moines City Railway and the

Inter-Urban Railway, Des Moines, Ia., will assume these positions on March 1. Mr. Wilson has long been connected with electric railroading and his experience covers city, suburban and interurban work. At Scranton, he had charge of the high-speed third-rail line connecting Wilkes-Barre and Scranton, 23 miles distant. This road does both a large passenger and freight service. Its equipment includes 30 passenger cars, 37 freight cars and two electric locomotives. Before becoming connected with the Lackawanna & Wyoming Valley Railroad, Mr. Wilson



Chester P. Wilson

was general manager of the Camps Bay, Capetown & Seapoint Tramway, Capetown, South Africa, one of the Wernher-Beit properties. Previously Mr. Wilson was chief engineer of the Milwaukee Electric Railway & Light Company, and at one time was general manager of the Sioux City (Ia.) Railway. He is a graduate in 1892 of Cornell, from which he also received, in 1896, the master's degree in engineering. As general manager of the Des Moines City Railway and the Inter-Urban Railway, Mr. Wilson will have charge of 152 miles of city and interurban railway operating more than 125 cars. The Inter-Urban Railway connects Des Moines, Colfax, Altoona, Mitchellville, Woodward, Perry, Herrold, Moran, Granger, Valley Junction and Norwoodville.

Mr. Henry M. Stine, who was recently appointed secretary of the Pennsylvania Street Railway Association, with permanent offices in Harrisburg, is a native of that city, where he was born in 1863. Mr. Stine was graduated from Harrisburg Academy, attended Dickinson College for three years and was graduated from the University of Pennsylvania in 1885. He was elected second lieutenant of Company I, Fourth Pennsylvania Volunteer Infantry, at the outbreak of the Spanish-American War and served in the United States and Porto Rico, being with this command in Porto Rico when peace was proclaimed. Mr. Stine is a member of the United States Spanish-American War Veterans' Association, the B. P. O. of Elks and Odd Fellows, and has served two terms as recorder of deeds of Dauphin County. He is very popular in Republican circles.

## Construction News

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

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

### RECENT INCORPORATIONS

**\*West Memphis Belt Line & Terminal Railroad, Little Rock, Ark.**—Incorporated in Arkansas to construct an electric railway, 12.14 miles in length, which is to circle West Memphis from Bridge Junction to Hopefield. Incorporators: Edwin Boysden, Wheatley; R. L. Mixon, H. F. Roleson, W. E. Ayers, Hugh Mixon, J. B. Badgett, E. E. Badgett and H. M. Pharr, Marianna; A. B. Shafer and L. P. Berry, Jr., Marion.

**\*Denver, Colorado Springs & Pueblo Interurban Electric Railroad, Denver, Col.**—This company has been incorporated in Colorado to build an electric railway from Denver through Colorado Springs to Pueblo. Capital stock, \$1,500,000. Incorporators: L. M. Pfeiffer, William S. Binford, F. C. Lewis, Charles Lederer and A. E. Van Deusen.

**\*Terre Haute & Southwestern Railway, Terre Haute, Ind.**—This company has been incorporated in Indiana to construct an electric railway from Terre Haute through Vigo and Sullivan counties and to the Wabash River, where it forms the boundary line between Indiana and Illinois. Capital stock, \$50,000. Incorporators: H. P. Taussig, H. C. Pugh, R. G. Watson, Robert Herkimer, S. C. McKean, H. B. Bement and Charles Minshall.

**Iowa & Southwestern Railway, Creston, Ia.**—This company has been incorporated to construct an electric railway between Clarinda, College Springs and Blanchard, a distance of 18 miles. Capital stock, \$300,000. Officers: William S. Farquar, College Springs, president; J. N. Miller, Clarinda, vice-president; J. H. Walkinshaw, Blanchard, second vice-president; L. H. Taggart, College Springs, treasurer; A. F. Galloway, Clarinda, secretary. [E. R. J., Feb. 13, '09.]

**\*London & Northwestern Railway, London, Ont.**—Application has been made to the Ontario Legislature by this company which proposes to build an electric railway from London to Sarnia, and from London to a point on Lake Huron, in the county of Huron. The route of the first line is to be through the townships of London, Lobo, East Williams, Adelaide, Warwick, Plympton and Sarnia; and that of the second through London, Lobo, East and West Williams, McGillivray, Stephen, Hay, Stanley and Goderich.

**\*Somerset (Pa.) Street Railway.**—This company has been chartered to build a railway, 11 miles long, to be operated either by electricity or gasoline, in Somerset county, with the main terminal at Somerset. Capital stock, \$60,000. Incorporators: J. A. Berkey, president; John C. Lowry, secretary; F. B. Fluck, C. L. Shover, A. K. Miller, J. C. McSpadden and A. L. G. Hay. [E. R. J., Jan. 2, '09.]

**\*Everett & Tacoma Railway, Snohomish, Wash.**—This company has been incorporated to build an electric railway between Everett and Tacoma. The surveys for the route which have already been made, practically parallel the line run by J. T. McChesney and those run by the old Snohomish Valley Railway. Capital stock, \$2,500,000. Incorporators: G. M. Cochran, E. Colburn, E. L. Colburn, Edgar Wright and O. E. Crossman, all of Snohomish.

### FRANCHISES

**San Diego, Cal.**—Application has been made to the City Council by the San Diego Electric Railway for a franchise for a new extension, which will commence at Tenth Street and K Street and terminate at Thirtieth Street and R Street. The application provides that actual construction on the extension shall be started within six months after the franchise has been granted, and that the line shall be completed within one year after actual construction has been started.

**Galesburg, Ill.**—The City Council has granted the Galesburg-Rock Island Traction Company a 30-year franchise for the construction of its proposed electric railway over certain streets of Galesburg. W. C. McWhinney, Kansas City, Mo., is promoting the railway. [E. R. J., Jan. 2, '09.]

**Joliet, Ill.**—The City Council has granted the Joplin & Pittsburg Railway, Pittsburg, Kan., a franchise for the purpose of making connections to its present system in operation. The provisions of the ordinance fix the completion of the extension on Elm Street to the grounds of the Manual Training Normal school in six months from the time of acceptance of the franchise. The connections and operation on the lines to Cherokee, Franklin and the camps in the north part of Crawford county are to be com-

Capt. Robert McCulloch, vice-president and general manager of the United Railways Company, of St. Louis, Mo., was elected president of the company on Feb. 11, to succeed Mr. John I. Beggs, whose resignation, with the reasons therefor, was announced in the *ELECTRIC RAILWAY JOURNAL* of Feb. 6, page 259. It is rare in these days for any railway manager to be closely identified with the policies and active direction of a large system for so long a time as 20 years. But in the case of Capt. McCulloch and the St. Louis system the period has extended over twice that period, or for four continuous decades, with the exception of a short period during 1903 and 1904, when Capt. McCulloch was general manager of the Chicago City Railway Company during the presidency of Mr. D. G. Hamilton, with whom he had been long associated in St. Louis. After Mr. Beggs had announced that he had decided to give his time exclusively to the active management of the Milwaukee system, his logical successor as president at St. Louis was Capt. McCulloch, and the latter's selection to that office is a fitting tribute to his broad knowledge of the St.



Robert McCulloch



Richard McCulloch

Louis transportation conditions as well as to the affection and high esteem in which he is held by his fellow townsmen. Capt. McCulloch is a native of Missouri, where he was born on Sept. 15, 1841, and is a veteran of the Confederate Army, in which he served with distinction. He went to St. Louis in 1869, and in 1871 he entered the service of the Bellefontaine Railway, St. Louis, as superintendent. Subsequently he was elected secretary of the company and later its vice-president and general manager. When Mr. D. G. Hamilton and his associates purchased the Citizens', St. Louis, Cass Avenue, North Central and Union lines in 1898 and consolidated them, Capt. McCulloch was elected vice-president and general manager of the consolidated system. He has always taken an active interest and part in the affairs of the American Street Railway Association and was its president in 1896-1897.

Mr. Richard McCulloch, assistant general manager of the United Railways Company of St. Louis, Mo., was elected vice-president and general manager of the company on Feb. 11, to succeed his father, Capt. Robert McCulloch, who has been elected president of the company. Mr. Richard McCulloch was born in St. Louis County, Mo., in 1869. He attended the public schools and Washington University in St. Louis, and was graduated from Washington University in 1891 with the degree of mining engineer. While attending college he engaged in street railway work during his vacation and also took part in the United States geological survey in Missouri, Arkansas, Indian Territory, Colorado and Montana. Mr. McCulloch spent a year in Mexico in the service of the Mexican National Smelting Company in 1891-1892. Returning from Mexico he took the expert course in the shops of the General Electric Company, in Schenectady and Lynn, in 1892-1893, and in the latter year was appointed engineer for the Cass Avenue & Fair Grounds Railway, St. Louis. Later he served as electrical engineer for the consolidated management of the St. Louis Street Railway, Citizens' Railway and Cass Avenue & Fair Grounds Railways, St. Louis. He has also had charge of the electrical reconstruction of the Baden Railway, Southwestern Railway and Citizens' Railway. Subsequently Mr. McCulloch went to Europe where he engaged in important electric railway engineering work, particularly in Geneva, Switzerland. He returned to the United States in 1901 and in 1903 accepted a position under his father, Capt. Robert McCulloch, with the Chicago City Railway, and later became connected with his father in the management of the United Railways Company of St. Louis as assistant general manager of the company.

pleted by January, 1910. Six months after the completion of these connections the company is to build a railway connecting Mulberry with Pittsburg.

**Sandwich, Ill.**—The De Kalb Midland Railway, which will build an electric railway from Somonauk through Sandwich and Waterman to De Kalb, and which plans, it is said, later to parallel the Chicago, Burlington & Quincy Railroad to Aurora, and to build a spur from Plano to Yorkville, has been granted a 50-year franchise by the Sandwich Council. [E. R. J., Dec. 12, '08.]

**Urbana, Ill.**—The City Council has granted the Chicago, Kankakee & Champaign Electric Railway a 50-year franchise for an electric railway from the north end of Market Street to the south end. The company was also given three years in which to build the railway. [E. R. J., Jan. 23, '09.]

**Sioux City, Ia.**—At a special meeting held in Le Mars, Ia., on Feb. 8, the people of this town voted a 25-year interurban and street railway franchise to the Sioux City & Spirit Lake Railway. On Feb. 10 the town of Paullina voted a similar franchise to this company. Other towns which previously had granted franchises to the company were Primghar, Hartley and Spirit Lake. All of the up-county franchises of this company have been secured and deeds have been secured to more than two-thirds of the right-of-way. The line will be 108 miles in length and will run from Sioux City northeasterly to Spirit Lake. Frank Patch, president. General offices, American Block, Sioux City. [E. R. J., Jan. 16, '09.]

**Boston, Mass.**—The Boston & Western Electric Railroad has filed a new petition for a certificate of exigency with the Massachusetts Railroad Commission. [E. R. J., Jan. 2, '9.]

**New York, N. Y.**—The Hudson & Manhattan Railroad has applied to the Public Service Commission for a franchise to extend its subway system from the present terminus at Sixth Avenue and Thirty-third Street to the Grand Central Station, connecting there with the Interborough subway and the Belmont or Steinway tunnel.

**Oneida, N. Y.**—The Oneida Railway has applied to the Common Council for a franchise for an extension to its lines from Sherrill to Kenwood.

**Sydney, N. S.**—The Sydney-East Bay Electric Tramway has applied to the Council of Cape Breton for a franchise for an electric railway from Sydney to the southern end of East Bay, with branches and spurs, the whole to have a length of about 17 miles. The proposal is being supported by the Cape Breton Electric Company, and the surveys made show a route along the main highway for the entire distance. W. Crowe explained the proposals of the promoters at a recent meeting of the County Council at Sydney, and asked that a guarantee of the principal and interest of \$500,000 of the company's bonds be given. A committee was appointed to investigate the company's plans and propositions.

**\*Roseburg, Ore.**—Milton Purdy is said to have applied to the Common Council for a 25-year franchise to build and operate an electric railway in Roseburg.

**Erie, Pa.**—An ordinance has been introduced in the Common Council granting the Buffalo & Lake Erie Traction Company a franchise to build a spur out onto the new dock at the foot of State Street.

**Williamston, S. C.**—H. H. Prince, representing the Greenville (S. C.) Interurban Railway, has been granted a franchise by the City Council. The franchise will be void after eight months if work is not begun and the line must be completed 12 months after work is begun. The proposed electric railway will connect Greenville and Williamston. [E. R. J., Feb. 6, '09.]

**\*Weatherford, Tex.**—The City Council has granted a franchise for a street railway to J. T. Patterson and associates of Weatherford, under the agreement that 1 mile of track shall be completed within one year and 2 miles within three years.

**\*Olympia, Wash.**—C. T. Morck, representing interests that plan to build an electric railway from Tacoma to Olympia, has applied to the City Council for a franchise to lay tracks on half a dozen of the principal down-town streets.

**Seattle, Wash.**—The City Council has granted the Seattle, Renton & Southern Railway a franchise over Third Avenue and Pine Street.

#### TRACK AND ROADWAY

**Pacific Electric Railway, Los Angeles, Cal.**—This company has let a grading contract to T. T. Crawford for a 2-mile extension to be built along Huntington Boulevard from Holt to Ganesha Park.

**\*Burbank, Cal.**—It is stated that L. C. Brand has placed a proposition before the people of Burbank to build an

electric railway in the city, providing a \$30,000 bonus is raised and the rights-of-way are furnished.

**Intermountain Railway, Denver, Col.**—This company operated on Feb. 1 its first cars by electricity between Denver and Golden, Col., a distance of 13 miles. The railway was formerly operated by steam, and locomotives will be used for the present in hauling freight, as in the past. The road was formerly known as the Denver & Intermountain Railroad. It is said that the company has expended \$135,000 in electrifying the system, buying new cars and equipment and erecting a power plant in Jefferson County, 5 miles from Denver. It owns a franchise to operate into Denver to Arapahoe and Fourteenth Streets. It also operates a spur between Denver and Barnum, a distance of 5 miles.

**Charleston, Westfield, Marshall & Terre Haute Electric Railway, Charleston, Ill.**—W. R. Patton, president, advises that this company proposes to build an electric railway between Charleston, Westfield, Marshall and Terre Haute. It is possible that contracts will be awarded in the near future for the construction of this projected railway. Capital stock, \$5,000. Officers: W. R. Patton, Charleston, president; James Dawson, Westfield, vice-president; Seymour Hurst, Marshall, secretary; J. W. Biggs, Westfield, treasurer.

**Galesburg, Aledo & Northwestern Railroad, Galesburg, Ill.**—Announcement is made that this company expects to commence work on its proposed gasoline motor line this spring. It will extend from Galesburg to Alexis, Aledo and Muscatine, Ia. Capital stock, \$10,000. Officers: B. F. Arnold, Galesburg, president; Capt. Frank Latimer, Galesburg, secretary. [E. R. J., Oct. 3, '08.]

**Metropolitan West Side Elevated Railway, Chicago, Ill.**—The committee on harbors, wharves and bridges of the Chicago City Council is considering an ordinance which will direct the removal or alteration of the bascule bridge owned and operated by the Metropolitan West Side Elevated Railway over the Chicago River between Van Buren and Quincy Streets. This bridge carries the main tracks of the elevated road leading from the west side of the city to the Union Elevated Loop. The ordinance if passed will direct the company, at its own expense, and within 90 days after the passage of the ordinance, to proceed to widen the draw of the bridge sufficiently to provide for a navigable channel between abutments of at least 140 ft.

**Capital Circuit Traction Company, Indianapolis, Ind.**—This company announces that it will build an electric railway connecting the following cities: Greenfield, Fortville, Noodlesville, Sheridan, Lebanon, Advance, Jamestown, North Salem, Danville, Clayton, Hall, Martinsville, Trafalgar, Franklin, Marietta, Shelbyville and Fountaintown. It has not yet been decided when contracts for the construction of the railway will be awarded. Headquarters, 1019 Law Building, Indianapolis. Officers: J. N. Crabb, 1019 Law Building, Indianapolis, president; J. W. Trotter, Danville, Ind., vice-president; C. E. Worth, secretary and treasurer; J. A. Shafer, 3710 North Illinois Street, Indianapolis, chief engineer.

**Des Moines & Sioux City Railroad, Des Moines, Ia.**—This company which proposes to build an electric railway, 196 1/2 miles between Des Moines and Sioux City, has been granted a franchise by the City Council of Des Moines. [E. R. J., Dec. 12, '08.]

**Iowa & Omaha Short Line, Council Bluffs, Ia.**—This company is said to have awarded the contract for the building of the section of its proposed electric railway from Council Bluffs, Ia., to Traynor, 15 miles, to George W. Adams & Co., Walnut, Ia. It is announced that grading on the remaining 115 miles will be undertaken this spring. J. H. Mayne, chief engineer, Walnut, Ia. [E. R. J., Sept. 12, '08.]

**Kansas City-Western Railway, Kansas City, Kan.**—This company is said to have started on a number of improvements to its railway system in Leavenworth, Kan., involving an expenditure of \$20,000. About half a mile of track will be rebuilt on new right of way. Four new bridges will be built. J. W. Richardson, Leavenworth, general superintendent.

**Joplin & Pittsburg Railway, Pittsburg, Kan.**—This company has purchased the lines of the Girard Coal Belt Electric Railway, which runs from Girard, Kan. in a northeasterly direction through the towns of Arma and Franklin to Croweburg, with a branch to Radley and Dunkirk. Arrangements are now under way for the immediate construction of from 8 to 10 miles of track to connect this newly purchased railway with the operating system of the Joplin & Pittsburg Railway.

**Winnipeg (Man.) Electric Railway.**—This company an-

nounces that during the year 1908 12,963 miles of track were constructed, 3,381 miles of this being surface track with ballast, 1,935 miles of track in wood block pavement, .887 miles of track in macadam pavement, and 6,758 miles of track with concrete foundation; 1,344 new poles were erected in the extension of power and electric lighting lines.

**Battle Creek, Coldwater & Southern Railway, Battle Creek, Mich.**—This company has purchased 26 miles of well-graded steam railroad roadbed on a 66-ft. right of way from Battle Creek south to Coldwater, Mich. It is proposed to construct and operate an electric railway and later make extensions from Coldwater south. The company is organized under steam railroad laws. It is expected that in June the preliminary arrangements will have been completed so that material can be purchased. C. E. Flynn, president Conneaut & Erie Traction Company, Erie, Pa., is president of the new company.

**Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich.**—This company announces that it expects to build a 12-mile extension this spring from Benton Harbor, and will probably call for bids for the same. H. C. Mason, Benton Harbor, general manager.

**\*Buckner, Mo.**—E. J. Daniels and a delegation of Buckner citizens have asked the Independence Commercial Club to meet with them and a delegation of Lexington citizens to consider the proposition of building an electric railway from Independence to Lexington.

**\*Kansas City, Independence & Southeastern Electric Railway, Independence, Mo.**—This company has been formed for the purpose of building an electric railway from Independence to Holden, Mo. The surveys are now being made. Bernard Zick, president.

**\*Kirksville, Mo.**—It is stated that G. W. Strubhar and George E. Woodhouse, Peoria, Ill., have been in Kirksville in the interest of Eastern capitalists, who are planning to build an electric railway from Connelville, in the western part of Adair County, through Novinger and Kirksville, to Gibbs, on the Santa Fé Railroad. The proposed railway will be about 30 miles in length.

**New York, Westchester & Boston Railway, New York, N. Y.**—The Public Service Commission of the Second District has given this company permission to construct its proposed third-rail electric railway from a connection with the New York subway to Port Chester, N. Y.

**Ithaca & Seneca Falls Interurban Railroad, Ithaca, N. Y.**—It is announced that this company is planning to begin the construction of its proposed electric railway this year. It will be about 47 miles in length and will connect the following cities: Ithaca, Trumansburg, Covert, Interlaken, Ovid, Willard, Romulus, Fayette and Seneca Falls. The power station and repair shops will be located at Ithaca. The company expects to furnish power for lighting. Jacob Rothschild, Ithaca, president.

**Third Avenue Railroad, New York, N. Y.**—Judge Lacombe of the United States Circuit Court has signed an order authorizing Frederick W. Whitridge, receiver of the Third Avenue Railroad, to construct a double-track extension from Fort George across the Harlem River to and along Pelham Avenue and the Southern boulevard to the Zoological Gardens in Bronx Park.

**Piedmont Street Railway, Salisbury, N. C.**—It is stated that this company has begun the construction of its proposed electric railway, which will extend from the central part of Salisbury to the Yadkin Valley Fair Grounds, to East Spencer and to China Grove. It is the intention of the company to have a portion of the system in operation by May 1. [E. R. J., Jan. 30, '09.]

**\*Durant, Okla.**—It is stated authoritatively by E. T. Haynes that a syndicate, headed by Col. J. D. Powers, W. S. Sterrett and others, will build an electric interurban railway that will connect Durant with a number of other cities and towns in Bryan County. The railway will be about 50 miles in length.

**Southwestern Traction Company, London, Ont.**—This company has offered to operate the municipal street railway in St. Thomas, Ont. The company asks the city to make certain improvements to cost about \$15,000. The matter is being considered by the Council.

**Toronto, Niagara & Western Railway, Toronto, Ont.**—It is stated that this company will soon make application to the Canadian Parliament for an extension of time to build an electric railway between Toronto, Ont., and Niagara Falls, N. Y.; Toronto and Windsor and St. Catharines and Port Colborne, and for power to increase the bond issue. This proposed railway is one of those in which Mackenzie & Mann, Toronto, are interested. Plans for the proposed route were filed in May, 1907, and it was said recently that work was being done on the United

States end of the route preparatory to the construction of a bridge across the Niagara River, on behalf of Mackenzie & Mann, in connection with this project. The line between Toronto and Niagara Falls will follow the route of the present power transmission line between these places.

**Allentown & Reading Traction Company, Allentown, Pa.**—This company has begun making the surveys for the extension of its lines from Lyons to Trexlertown or East Texas. This line is to connect with the present line of the Allentown & Reading Traction Company at Lyons and is then to run through Bowers, Hancock, Topton, Mertztown, Shamrock, Alburtis, Trexlertown and possibly East Texas. The company also intends to take out more of the curves on its present line, so as to cut down the running time between Allentown and Reading.

**Conestoga Traction Company, Lancaster, Pa.**—It is stated that this company, which has acquired the right-of-way and franchises of the Coatesville & Lancaster Railway, expects to put about 600 men to work March 1 on the construction of that part of the line between Christiana and Parkesburg, a distance of 5 miles. It is the intention of the company to give a through service between Lancaster and Philadelphia by July 4. It is said that eventually a working agreement will likely be entered into between the Lancaster interests and the West Chester Street Railway, which operates the road from Coatesville to West Chester.

**San Antonio (Tex.) Traction Company.**—This company announces that it contemplates building, in the near future, a 4-mile extension via the stock yards, to Palm Garden, a suburb.

**Roanoke Railway & Electric Company, Roanoke, Va.**—Work has just been commenced by this company on the extension of its line through the town of Salem. It will be about 1 mile in length, and it will also reach Lake Spring.

**Walla Walla Valley Traction Company, Walla Walla, Wash.**—This company, which is operated by the Northwestern Gas & Electric Company, advises that it expects to build 15 miles of new track during this year.

**Milwaukee Northern Railway, Cedarburg, Wis.**—It is announced that this company will double-track the line in operation from Milwaukee north to Cedarburg, and build a single-track branch from Cedarburg west to West Bend this year. The company's plans call for a line from Milwaukee north to Cedarburg, where it forks, one branch extending north to Sheboygan and the other northwest via West Bend to Fond du Lac, in all 120 miles.

**Wausau (Wis.) Street Railway.**—This company is said to be preparing plans for the construction of an electric interurban railway to connect Grand Rapids with Port Edwards and Nekoosa. Preliminary surveys are now being run between Grand Rapids and Nekoosa. It is the ultimate plan of the company to extend the railway to Stevens Point, Wausau and Merrill.

## POWER HOUSES AND SUBSTATIONS

**Hattiesburg (Miss.) Traction Company.**—This company expect to increase its power plant equipment by installing two 500-kw turbo-generators and a motor-generator set for railway service.

**Union Railway, New York, N. Y.**—This company has awarded a contract to the Raymond Concrete Pile Company for placing concrete piles in the foundations of sub-station No. 2 at 165th Street and Brook Avenue, New York. J. H. Deeves & Bros., general contractors.

**Walla Walla Valley Traction Company, Walla Walla, Wash.**—This company is in the market for four 1000-hp water wheels, two 500-kw units, either steam or gas, for auxiliary plants, and one 500-kw unit for a hydro-electric plant. F. S. Drake, manager.

## SHOPS AND BUILDINGS

**Chicago, Lake Shore & South Bend Railway, South Bend, Ind.**—This company has purchased a site opposite the Post Office Building and will proceed at once to erect a terminal station thereon. It is said that the building when completed will cost about \$300,000.

**Toronto (Ont.) Railway.**—This company has completed arrangements for the construction of a car house on the west side of Lansdowne Avenue, north of Bloor Street. The plans show a brick and concrete structure, 100 ft. x 350 ft., with accommodation for over 100 cars.

**Pittsburg (Pa.) Railways.**—It is stated that this company is planning to tear down its Oakland car house in the near future. The car house covers 200 ft. x 179 ft. on Fifth Avenue, extending from Atwood Street to Oakland Avenue.



# Manufactures & Supplies

## ROLLING STOCK

Michigan United Railway, Lansing, Mich., will soon purchase four interurban cars.

Walla Walla (Wash.) Valley Traction Company expects to purchase two interurban cars.

Syracuse (N. Y.) Rapid Transit Company is reported to be planning the purchase of 25 city cars.

Hattiesburg (Miss.) Traction Company expects to purchase six motor cars with complete electric equipment.

Jamestown (N. Y.) Street Railway has purchased 10 second-hand cars from the Third Avenue Railroad, New York.

Winnipeg (Man.) Electric Railway has ordered from a Canadian car builder 30 cars, for which Brill trucks have been specified.

Third Avenue Railroad, New York, it is reported, will increase to 275 the order recently placed with The J. G. Brill Company for 200 pay-as-you-enter cars.

Chicago, Lake Shore & South Bend Railway Company has purchased one No. 1 Russell snow plow from the Russell Car & Snow Plow Company, Ridgway, Pa.

Houston (Tex.) Electric Company, which was mentioned in the ELECTRIC RAILWAY JOURNAL of Dec. 19 as planning to purchase a number of cars, has ordered 15 cars for June 1, 1909, delivery.

Portland (Ore.) Railway & Light Company has placed an order with the National Brake & Electric Company, Milwaukee, Wis., for 100 of the latest type semi-automatic brake equipments.

Kent Traction Company will soon be ready to purchase 10 cars for its new line from Tolchester to Chestertown, Md. Alva A. Lamkin, 611 Equitable Building, Baltimore, Md., is general manager.

Detroit (Mich.) United Railway, which was recently noted in the ELECTRIC RAILWAY JOURNAL to be planning to purchase 75 cars during 1909, will, it is stated, be prepared soon to receive bids for 50 city cars.

Seattle (Wash.) Electric Company will buy 30 more city cars immediately. It was announced in the ELECTRIC RAILWAY JOURNAL of Dec. 26, 1908, that the company expected soon to be in the market for this equipment.

Shore Line Electric Railway, New Haven, Conn., which was noted in the ELECTRIC RAILWAY JOURNAL of Feb. 6, 1909, as being in the market for four interurban cars, will, it is now reported, increase the order to six or eight cars, and will likely later on purchase 20 more.

Seattle, Snohomish & Everett Railway Company expects to purchase from 6 to 10 interurban cars for its new line from Seattle to Snohomish, on which construction work will soon be begun. Charles W. Kimball, 443 New York Block, Seattle, Wash., is general manager.

San Antonio (Tex.) Traction Company has ordered 10 semi-convertible cars, each equipped with four GE-54 motors, from the American Car Company, to be delivered May 15, 1909. The seating capacity of these cars will be 40. The rear platform will be 7 ft. long, with entrance step on one side only. The principal specifications of the cars follows: Wheel base, 4 ft. 6 in.; length of body, 28 ft.; length over all, 42 ft.; width inside over all, 8 ft. 2 in.; sill to trolley base, 12 ft. 1 in.; curtain fixtures, Forsyth No. 86; curtain material, Pantasote; destination signs, Hunter; fenders, American Car Company; gongs, Brill Dedenda; hand brakes, Peacock; headlights, Crouse-Hinds arc; journal boxes, Brill; markers, Brill; seats, "Winner"; side bearings, Brill; trucks, type and make, Brill No. 27 G-1.

Milwaukee & Fox River Valley Railway, Sheboygan, Wis., has placed an order for two combination passenger, smoking and baggage cars with the Cincinnati Car Company, Cincinnati, Ohio. These cars are to have an overall length of 50 ft., length over vestibule 49 ft., width overall 8 ft. 10 in., height, sill to trolley base, 9 ft. 4 in. Special equipment specified includes built-up type steel bolsters, Van Dorn No. 11 couplers, Curtain Supply Company's curtain fixtures, Pantasote curtains, two 14-in. gongs, Peacock hand brakes, hot-water heaters, Eureka 12-in. arc headlights, Lintern markers, pneumatically operated sanders, Hale & Kilburn "Walkover" seats, Cincinnati Car Company's standard steps. The cars are to have an interior finish of quarter-sawed oak, are to have monitor-deck roofs, and are each to be provided with but one vestibule at the rear of the car.

Buffalo, Lockport & Rochester Railway, Buffalo, N. Y., which was reported in the ELECTRIC RAILWAY JOURNAL of

Jan. 30 as having placed an order for 15 interurban cars with the Cincinnati Car Company, Cincinnati, Ohio, has made up the following specifications for six of the cars, which are to be built for early delivery: Combination two-compartment type with an overall length of 51 ft. 6 in.; length of body 41 ft. 2 in.; width overall 8 ft. 7 in.; height, sill to trolley base, 9 ft. 6 3/4 in.; height from top of rail to sills 41 1/2 in. The body and underframe are to be of the usual wood and steel construction. Special equipment specified includes steel bolsters of the built-up type, brushed brass trimmings, M. C. B. automatic radial couplers, Curtain Supply Company's No. 89 curtain fixtures, Pantasote curtains, wing dasher destination signs, Cincinnati Car Company's wooden pilots, two 14-in. pedal alarm gongs, Peacock hand brakes, Peter Smith Heater Company's hot-water heaters, Crouse-Hinds Imperial "A" head lights, mahogany interior finish, marker lamps and flags, pneumatically operated sanders, Hale & Kilburn "Walkover" seats, Cincinnati Car Company's standard wood steps, Hart's sash ratchets, emergency tools, double-fare registers, Knutson trolley retrievers, Kalamazoo snow scrapers, and rubber-floor mats for the aisles of the car. The cars are to be painted a Pullman green, and are to have monitor roofs.

Indianapolis Traction & Terminal Company, Indianapolis, Ind., as announced in the ELECTRIC RAILWAY JOURNAL of Jan. 23, 1909, recently placed an order with the Cincinnati Car Company for 10 15-bench open cars and 44 closed cars. The open cars will have a seating capacity of 75. The underframes will be of wood and steel and the body bolsters will be of the built-up steel type. The wires will be run in armored iron conduit. There will be a running board the full length of one side of the car. Cross slat seats will be installed. The principal specifications of the open cars follow:

Wheel base . . . . .	4 ft. 10 in.	Motors, type and number,
Length over all . . . . .	42 ft. 2 in.	2 West., 93-A-2
Width over all . . . . .	8 ft. 3 in.	Sanders . . . . .
Air brakes,	Westinghouse straight air	Trolley poles and attach-
Curtain fixtures,	Curtain Supply open car	ments . . . . .
Hand brakes . . . . .	Peacock	Shelby poles
Headlights,	Dayton No. 1561 dash	Trucks, type and make,
		Standard 0-50
		Special devices,
		International R-5 duplex
		registers, Wilson trolley
		catcher.

The body and underframe of the closed cars will be of wood and steel. The interior will be finished in cherry. The roofs are to be of the monitor deck type. The principal specifications of the closed cars follow:

Wheel base . . . . .	4 ft. 10 in.	Heating system,
Length of body . . . . .	33 ft. 2 1/2 in.	Peter Smith, No. 2-C
Length over all . . . . .	46 ft. 8 7/8 in.	Headlights . . . . .
Width over all . . . . .	8 ft. 4 in.	Dayton No. 1561
Height, sill to		Motors, type and number,
trolley base . . . . .	8 ft. 10 in.	West., 93-A-2
Height from track		Sanders . . . . .
to sills . . . . .	31 in.	Cincinnati Car Co.
Air brakes,	Westinghouse S-M-2	Seats . . . . .
Curtain fixtures,	Curtain Supply Co. No. 89	Hale & Kilburn
Curtain material . . . . .	Pantasote	Trolley poles and attach-
Hand brakes . . . . .	Peacock hand	ments . . . . .
		Shelby
		Trucks, type and make,
		Standard 0-50
		Special devices, etc.,
		International registers,
		Wilson trolley catcher.

## TRADE NOTES

W. T. VanDorn Company, Chicago, Ill., has made satisfactory tests of the VanDorn radial draw-bar and of the anti-buckling radial draw-bar attachment which the company has recently perfected under the direction of W. T. VanDorn.

Crane Company, Chicago, Ill., has placed a contract with Lanquist & Illsley Company, Chicago, for the construction of a fire-proof six-story warehouse at the corner of Canal and Fifteenth Streets. The new building is to have a ground-floor space 190 x 241 ft. and it is expected that it will cost \$300,000.

Hagstrom Brothers Manufacturing Company, Linsborg, Kan., manufacturer of specialties for electric railways, telephone companies, etc., has increased its capital stock from \$50,000 to \$150,000. The company will soon place on the market a train location indicator, for use by electric railways and other transportation systems.

Triad Engineering & Construction Company, Goshen, Ind., has recently been organized to engage in building electric railways. The company is composed of Harry A. Butterfield, of Goshen, Ind., and A. W. Malone, and C. A. Burnett, of Warsaw, Ind., all of whom have been associated with the Winona Interurban Railway Company, operating an electric railway in Indiana.

Chicago Pneumatic Tool Company's annual report for the year ended Dec. 31, 1908, states that, owing to the depression of 1907, the volume of sales was reduced 45 per cent as compared with the previous year. Profits for the year are given as \$289,625.24, and surplus carried forward as \$821,564.31.

Dearborn Drug & Chemical Company announces that Herbert E. Stone has just become connected with the company as manager of sales in the Eastern department, with headquarters in New York City. Mr. Stone was formerly president of the National Association of Steam Engineers and recently manager of the Pittsburg office of the Chapman Valve Company.

Union Spring & Manufacturing Company, Pittsburg, Pa., reports making extensive sales of its Kensington all-steel journal box which was recently placed on the market. The cellar of this box is made of 1/4-in. pressed steel, the cap is a steel casting and the weight of the box is said to be 10 lb. less than malleable iron journal boxes of the same size. The Kensington box is of the M. C. B. type, and is designed especially for freight-car equipments.

Lawrence Manning Engineering & Construction Company, Camden, S. C., has recently been incorporated with a capital stock of \$5,000. Lawrence Manning, formerly general manager of the Owosso & Corrunna Electric Company, Owosso, Mich., is president of the company, with headquarters in the Mann Building, Camden, S. C. By its charter the company is empowered to engage in general consulting and supervising engineering and general contracting.

Power Equipment Company, Chicago, Ill., reports that the work of removing the four 5000-kw generating units from the Fisk Street power plant of the Commonwealth Edison Company, Chicago, is progressing satisfactorily. The company has charge of removing these units, and will direct the installation of an 8000-kw unit in the place of each of the smaller units. The company is also removing a 3000-hp. tandem compound twin engine from the Harrison Street plant of the same company, and will direct the sale of these and other equipments.

Crocker-Wheeler Company, Ampere, N. J., held its annual dinner of officers and salesmen last week at the Machinery Club in the Hudson Terminal Building, New York. Plates were laid for 35 guests. The managers of the branch offices brought in favorable accounts of the present situation in their respective territories with regard to the market for electrical machinery. Everywhere manufacturers seem to be willing to consider improvements, such as the electrification of their plants or the installation of further electric motors where their plants are already using electric power.

Allis-Chalmers Company, Milwaukee, Wis., states that the Memphis Consolidated Gas & Electric Company, which put an Allis-Chalmers steam turbine and generator of 1500-kw capacity in operation some time ago, has contracted for two additional units with a combined output of 3000 kw. The Cleveland, Southeastern & Columbus Railway Company, Cleveland, Ohio, has arranged to place in its power house a 1000-kw turbine unit. The Pueblo & Suburban Traction & Lighting Company, Cedar Rapids & Iowa City Railway & Light Company, Evansville Terminal Railway, and the Willamette Valley Company, Eugene, Wash., have recently placed turbines in service; and repeat orders for these machines or contracts for more than one unit have come from the Kokomo, Marion & Western Traction Company, Kokomo, Ind., and the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

Stone & Webster Engineering Corporation, Boston, Mass., has moved its Seattle office to the White Building, which it built for the Metropolitan Building Company. The White Building is an 11-story steel-frame structure 111 ft. x 121 ft. The floors are of reinforced concrete and the walls are of brick with granite and terra-cotta facing and trimmings. About 1250 tons of structural steel were used in the construction. Ground was broken on March 1, 1908, and the building was ready for occupancy Jan. 1, 1909. The Stone & Webster Engineering Corporation has recently begun the construction of a similar building for the Metropolitan Building Company, which will be known as the Henry Building. Both of these buildings are located on what is known as the "University Tract," a large section of land in the business section of Seattle, leased to the Metropolitan Building Company under favorable conditions. The White Building was constructed on the "cost plus" basis and the Henry Building is being built on the same terms.

#### ADVERTISING LITERATURE

Western Electric Company has issued bulletin No. 5533, on series incandescent lighting with tungsten lamps.

Buckeye Electric Company, Cleveland, Ohio, has published a folder showing the advantages of tungsten lighting as compared with arc lamps.

Frank Ridlon Company, Boston, Mass., is sending out a special bulletin of bargains in second-hand motors of all types ranging from 1 hp to 200 hp.

Industrial Progress, a monthly magazine devoted to Allis-Chalmers apparatus, contains a description of the Kokomo, Marion & Western Traction Company in its February number.

Wire & Telephone Company of America, Rome, N. Y., has issued its regular annual pamphlet, "Copper History," showing the monthly and yearly average prices of copper from 1883 to 1909.

Rodger Ballast Car Company, Chicago, Ill., is sending out an illustrated wall calendar with weekly sheets, each of which carries a half-tone of some design of Hart convertible ballast or freight cars.

The F. Bissell Company, Toledo, Ohio, has issued an a.c. switchboard bulletin covering single, two-phase and three-phase installations, as well as d.c. exciter panels. Prices are given for a large number of listed boards.

R. Woodman Manufacturing & Supply Company, Boston, Mass., has published a new and enlarged edition of its catalog on railroad ticket punches, badges, trainmen's fittings, sealing presses, counting machines, car pushers, etc.

American Brake Shoe & Foundry Company, Chicago, Ill., has sent out a pamphlet giving a list of the manganese steel castings which it can furnish. It is also prepared to supply vanadium, chrome, nickel, chrome-nickel and high carbon steel castings.

General Electric Company, Schenectady, N. Y., announces the following bulletins: No. 4650, on large shell type transformers; No. 4641, on electric light and power in the lumber and woodworking industries; No. 4642, on d. c. switchboard instruments, types D2 and D3; No. 4644, motor generators as designed particularly for searchlight service; also a booklet on fan motors for 1909.

Allis-Chalmers Company, Milwaukee, Wis., has recently issued or has under way 187 bulletins and instruction books describing the products of its various departments. These include the manufacture of prime movers of every description, electrical apparatus for alternating and direct current, pumping machinery, mining machinery, crushing and cement-making machinery, flour mill machinery, saw mill machinery, etc. Information descriptive of all of the foregoing is indexed in a convenient manner for reference.

Stone & Webster, Boston, Mass., have issued their annual for 1909, giving brief descriptions of the various properties under their management, summaries of the capitalization and earnings for 1908, and particulars regarding the securities. The securities department maintained by Stone & Webster acts for the companies in placing their securities with bankers and investors, handles securities for those who wish to purchase or sell, keeps careful and accurate quotations, and is the channel through which information concerning the companies operated by Stone & Webster and their securities is given out.

#### NEW PUBLICATIONS

Hendrick's Commercial Register of the United States. New York: S. E. Hendricks; 1240 pages. Price, \$10.00, express prepaid.

This is the seventeenth edition of a work almost indispensable to buyers of engineering material. Its completeness may be gaged from the fact that it contains over 350,000 names and addresses and 30,000 business classifications.

Handbuch über Triebwagen für Eisenbahnen (Handbook of Self-Propelled Railway Cars). By C. Guillery, Munich and Berlin; R. Oldenbourg, 1908; 202 pages (6 1/2 in. x 9 1/2 in.); with index, including 93 illustrations. Price, 7.50 marks.

The subject of self-propelled cars is of even greater interest abroad than in this country, and as the installations are far more numerous, the author of this work has had the opportunity to collect and classify a great deal of data. The information relative to the American cars such as the Union Pacific has already been presented to readers of this journal, but those who are interested enough to pursue the subject in greater detail will find this work of benefit. The writer first discusses the field of the self-propelled car and some of the steam cars of the earlier part of the last century. The greater part of the work, however, is devoted to the modern cars of the steam, gasoline, gasoline-electric, storage battery and other types. The author says that all attempts to operate self-propelled cars with other than skilled mechanics have proved a failure. Such cars require at least as much care as a steam locomotive, even though the labor is not so great.