

# Electric Railway Journal

A CONSOLIDATION OF

Street Railway Journal and Electric Railway Review

VOL. XXXII

NEW YORK, SATURDAY, OCTOBER 10, 1908

No. 19

PUBLISHED EVERY SATURDAY BY THE

## McGraw Publishing Company

James H. McGraw, President. J. M. Wakeman, 1st Vice-president.  
A. E. Clifford, 2d Vice-president. C. E. Whittlesey, Sec. and Treas.

Henry W. Blake, Editor.

L. E. Gould, Western Editor. Rodney Hitt, Associate Editor.  
Frederic Nicholas, Associate Editor.

NEW YORK, 239 WEST THIRTY-NINTH STREET.

CHICAGO: Old Colony Building.

PHILADELPHIA: Real Estate Trust Building.

CLEVELAND: Schofield Building.

LONDON: Hastings House, Norfolk St., Strand.

Cable Address, Stryjourn, New York; Stryjourn, London—Lieber's Code.

Copyright, 1908, by the McGraw Publishing Company.

### TERMS OF SUBSCRIPTION

United States, Hawaii, Puerto Rico, Philippines, Cuba, Mexico and Canal Zone.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also special daily convention issues published from time to time in New York City or elsewhere), postage prepaid. \$3.00 per annum  
Single copies .....10 cents

Combination Rate, with Electric Railway Directory and Buyer's Manual (3 issues—Feb., Aug. and Nov.).....\$4.00 per annum

Both of the above, in connection with American Street Railway Investments (The "Red Book"—Published annually in May; regular price, \$5.00 per copy).....\$6.50 per annum

CANADA: extra postage.....\$1.50 per annum

To All Countries Other Than Those Mentioned Above.

ELECTRIC RAILWAY JOURNAL (52 weekly issues and also daily editions as above), postage prepaid.....\$6.00 per annum  
25 shillings. 25 marks. 31 francs.

Single copies.....20 cents

Foreign subscribers may remit through our London office.

### NOTICE TO SUBSCRIBERS.

CHANGE OF ADDRESS.—The old address should be given, as well as the new, and notice should be received a week in advance of the desired change.

BACK COPIES.—For back copies of the ELECTRIC RAILWAY JOURNAL, STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW, applications should be addressed to the McGraw Publishing Company. No copies of issues of the STREET RAILWAY JOURNAL or ELECTRIC RAILWAY REVIEW prior to January, 1907, are kept on sale except in bound volumes.

DATE ON WRAPPER shows the month at the end of which the subscription expires. The sending of remittances for renewal prior to that date will be much appreciated by the publishers.

*Of this issue of the ELECTRIC RAILWAY JOURNAL 12,500 copies are printed.*

### Car Colors in New York

The orange color which has been characteristic of the surface cars in New York City is disappearing rapidly, and is being replaced by green on the Metropolitan Street Railway cars and red on the Third Avenue cars. Doubtless there was no intention of appealing to the prejudices of any of the foreign born citizens in New York City in this choice of colors, but the change is an interesting one

as showing the pigments which, in the opinion of those in charge of the work, are the most durable. Red was the original color of the Third Avenue cars, and undoubtedly was selected for this reason. The color of the Metropolitan cars, however, was chosen after an extended study of all of the different colors on the part of the mechanical department of the company, and is mentioned in the report, just issued of the receivers as being one which would keep the cars from becoming discolored and dingy in appearance, and which would reduce their cost of maintenance.

### Making Repairs Outside of the Shop

The equipment of a repair shop for a small road, operating less than 100 cars, is a matter worth quite as careful consideration as the equipment of a much larger shop. If tools are installed for making heavy repairs, such as changing or turning wheels and machining truck parts, they will represent a large investment, which stands idle much of the time in the small shop, and the expense of each operation with these tools consists not only of the wages of the operator and the cost of the power required, but a proportion of the annual interest and depreciation charge on the machine. For this reason some companies make a practice of having this heavy work done in an outside general machine shop. An extreme example is a city road in the Middle West, which has just completed a new shop and has equipped it with only two machine tools—an engine lathe and a drill press—although the company operates 65 motor and 25 trail cars. All repair work which cannot be done with these two machines and the ordinary machinist's hand tools is sent out to local machine shops. Wheels and axles are shipped by freight to a machine shop in a large city 125 miles distant for dismounting and mounting. Other companies go to the other extreme. Several, with less cars than that already cited, operate brass foundries, and at least one of moderate size considers it profitable to make its own iron castings.

### Assessment on Real Estate to Pay for Rapid Transit

Electric railway managers will be interested in a plan recently proposed by the City Club, of New York, that the cost of additional rapid transit lines in that city should be assessed in part upon the owners of the property benefited. The suggestion is at least a seasonable one, not only for New York but for other cities as well, because there is now small inducement to invest much further capital in transportation enterprises. The constant burden of transfers, the other increasing restrictions on profitable operation, the added requirements in accounting and the higher cost of materials and labor, have combined to reduce the profit of most urban railway properties to the vanishing point. The proposal may dampen the ardor of real estate

owners toward electric railway extensions, but if no one else will pay the bills, they must do so if the lines are to be built.

The suggestion of the City Club relates particularly to elevated and subway lines, and is addressed to the Board of Estimate and Apportionment and to the Public Service Commission. New York, like other cities, is greatly in need of additional rapid transit facilities, and their construction would develop tremendously the value of outlying districts of the city. Statistics compiled by the City Club indicate that in many sections of New York the construction of the existing subway line was followed by increases in the assessed value of the land thereby benefited amounting to from 60 to 100 per cent and, in the aggregate, far in excess of the entire cost of the subway. Under the existing laws, however, the railway company receives no direct benefit from this increase in real estate values; the profit all goes to the owners and to the city in the increase of rateable values.

Of course, voluntary subsidies for a railway extension can always be raised among the owners of the property improved, but these subsidies cannot, by their nature, be proportioned equitably. Some persons will contribute and others will not. A rapid transit line benefits all the property in the district served, as does a sewer or other street improvement, and, logically, there is equal reason why its cost should be assessed against the real estate. In fact, if there is no incentive to private capital to build the line, it must be financed in this way or not at all. The City Club believes that the plan suggested is entirely constitutional in New York State, although it is quite possible that legislative enactment would be necessary, or at least advisable, before it should be put in force. As a solution of the present electric railway problem, it at least recognizes the condition that the railway companies can no longer afford to build up outlying districts of the city without some change from the condition by which the railway company assumes all of the burdens and others gain the profits.

### Financing the Cost of Electrification

Public agitation for electrification of the Chicago terminal of the Illinois Central Railroad has been followed by the announcement that the company will make a study of the subject. If electrification follows, it will be the fourth great terminal reformation of this character to be worked out by steam railways in this country. The first was the electrification of the Belt Line tunnel in Baltimore; the second was that of the Grand Central Station in New York for the New York Central & Hudson River and the New York, New Haven & Hartford railroads; the third is the construction, now under way, of an electrified terminal in New York for the Pennsylvania and Long Island railroads, with coincident electrification in tributary and suburban districts.

The motives inducing electrification of these four important terminals were practically the same, although the benefits to be derived therefrom by the railways concerned will be different, owing to the extent and character of the installation. In each case the controlling motive was the elimination of smoke in the confined space of a tunnel. In Baltimore the electrification is confined purely to such

operation, whereas in the other two instances a considerable extent of suburban line has been equipped.

It is stated that a prominent engineer was invited a few years ago to consider, on behalf of a syndicate of European capitalists, the construction of a new railway from New York to Chicago. Upon preliminary investigation this engineer, it is related, concluded that the cost of terminals in New York City would be about \$100,000,000, which would impose a capitalization of approximately \$100,000 per mile on the new company for the mileage between New York and Chicago, with nothing to show for the investment but costly terminals at the eastern terminus; thereupon the project was abandoned. The Pennsylvania Railroad, however, has made an investment of this character, but its purpose and the uses to which its terminals can be put are broader than would be attainable by a trunk line extending only between New York and Chicago. It will bring to Manhattan Island not only the trains from the various Western lines of the Pennsylvania system, but it will also accommodate passengers from the Long Island Railroad; thus the Pennsylvania System acquires a terminal for its through lines in the largest city of the country, and will be in a position to provide for handling successfully a large and increasing suburban business on the lines of the Long Island road.

In essential respects the motives for the proposed electrification of the Illinois Central Railroad would not be exactly parallel with those outlined in the other instances. There are no tunnels, but a crusade has been started in Chicago to abolish the smoke nuisance and secure at the same time the other advantages incident to the use of electric power. Such an improvement, however desirable, has other points of view than that simply of the public convenience. It should also be considered with relation to the appalling expense involved and the rights of those who must advance the capital required to perfect a betterment of this nature. The public will not do this; the cost must be defrayed by the railways, either through the issue of stock or an increase in debt, and they should receive a fair return upon the amount risked. It is clear that the electrification of a terminal equipped for the operation of steam locomotives involves some destruction of valuable property, a destruction which cannot be regarded lightly. Investments worth many millions of dollars must be swept away. In a fair valuation full credit would be given for the discrepancy between capital account and property value, resulting from an improvement of this nature; but in an unfair valuation, such as is frequently proposed, this destruction in value would be disregarded, and an arbitrary method of computing the replacement value of the property would be substituted, with what may be described as a two-fold purpose: (1) to reduce the capitalization to a point that would be on an equality with the figures ascertained by unjust means; (2) to permit computation of rates that would afford at the most a fair return on the investment demonstrated by so confiscatory a method of appraisal.

It would be idle to say that the railway should be satisfied if the reduction in its operating expenses and increases in gross revenue arising from electrification result in a return on the capital actively used. In any appraisal there should be recognition of the loss of property.

### Electric Railway Trials Abroad

The elaborate report on the electrical equipment of the Victorian Suburban Railway system, published last week, is made public in practical coincidence with the results of the extended series of tests in regard to electrical equipment for trunk line traffic conducted by the Swedish government. These trials have been under way for more than a year, and, following the recommendation of Robert Dahlander, chief engineer of the Swedish State Railways, have been conducted with single-phase equipments only.

A recent number of *Engineering* (London) contains a very instructive resumé of the Swedish experiments. It has been carried on both with motor cars and with locomotives, all fitted for use with single-phase current. The power plant enabled use to be made of 15, 20 and 25 cycles at will, also of various line voltages. Full details of the work are not given, but the general results appear to have been favorable and to show that the single-phase motors are capable of admirable performance. An interesting question is raised as to the frequency desirable. The American builders seem to favor 15 cycles, although quite prepared to work at 25 cycles. Some of the Continental makers, on the other hand, are entirely satisfied with 25 cycles. A table of comparative weights of various types of electric motors is given which reveals some rather curious features. Five geared single-phase machines designed for 25 cycles give an average weight per horsepower output of 18.3 kg. Three continuous current machines of not far from similar output, also geared, average 16.5 kg per horse-power. As commercial designs of several first-class makers are represented in this comparison, it would seem a fair inference that the single-phase machines run about 10 per cent heavier than the continuous current machines. The lowest figure, 9.4 kg per horsepower, is reached by the direct coupled three-phase locomotives of the Simplon Tunnel, but these are much larger than those just compared and work at 16 cycles. The armature speeds of the single-phase motors ranged from 400 to 750 r.p.m.; those of the continuous current motors from 370 to 720. The efficiencies and power factors of all the single-phase motors proved to be highly creditable.

No difficulty was experienced in collecting current at any voltage economically desirable for the overhead equipment, those tried ranging at times to about 20,000, with 5000 as the minimum. In the windings and general design of the motors tried there were considerable variations, some being rated more closely than others and showing considerable loss in efficiency and power factor at the higher loads. The results thus far have been merely tentative, but considerable progress has been made and it seems to have been thoroughly demonstrated that excellent results can be obtained.

Some years of trial abroad seem to have left still surrounded in doubt the question which system of electric power will yield the best results in the larger railway work. Recent developments show that it is entirely practicable to build big motors for, say, 2000 volts direct-current, which introduces still another feature into the general comparison. Of the big Continental firms, Brown, Boveri & Company and Ganz & Company adhere tenaciously to three-phase work, and they have undeniably

made a success of it. Most of the other makers put their trust in single-phase and their works have justified their faith, and then there is left the high-voltage continuous current method which finds still supporters whose judgment must be treated with respect. Such engineers as H. F. Parshall and H. M. Hobart are found in this group. The recommendation of direct current for Melbourne by Chas. Merz will add encouragement to this school. There is a pronounced tendency on the continent of Europe toward single-phase working, and to its advocates the Swedish tests are very encouraging. As between the three methods mentioned, there is no very serious difference in efficiency outside the distributing system. Every one of them has been proved capable of excellent work, and the differences sink to practical ones only to be determined by somewhat extensive experience. Matters of repairs, of convenience in operation, of reliability under railway conditions are things not to be determined merely by tests.

After all is said and done, success in electric railroading on a large scale goes far deeper than the electrical system adopted. There is much to be learned about the working of any of the systems in practical railroading. There are some big and well administered electric railways abroad, but there is none yet approximating in capacity and in intricacy of operation the important railway systems of our country. Indications are strong that important changes of motive power will come soon, and then the necessary experience will be acquired, in our judgment, more easily and conveniently than some people think. It is a long step from a large interurban or purely terminal system to a general system of haulage on a trunk line, but the step is going to be taken within a comparatively short time. Probably it will lead to some new ideas about the proper system to employ. It also may well lead to some considerable modification in handling traffic to better fit electrical operation. There is no doubt at all about getting locomotives powerful enough and fast enough for every class of traffic. The big machines of the New York Central and of the Simplon Tunnel leave no doubt on one point, and as to speed the Zossen tests were sufficient to convince the most dubious. The vital question is now to take such material and best fit it to the everyday work of an American railroad with its long reaches of sometimes none too strong track, its complex service and its not uncommonly oppressively heavy traffic. This is work for the railway manager rather than for the electrical engineer, yet both must labor in harmony. The former must ask the latter not "How can you handle the freight and passenger traffic on our mountain division without changing our train dispatching schedule?" but "How can we make electric locomotives do our work simply and with economy?" When the two put their heads together and begin to scheme the difficulties will begin to vanish. Thus far the larger work of electric railroading, while it has certainly involved serious physical problems, has not had to take all the difficulties into account. Perhaps the Valtellina system shows the most nearly complete change in motive power, but even that is far from being intricate enough to afford a typical example of trunk line work. If the Swedish railway engineers expect to be in the front rank of progress they must hustle, for American railway managers are waking up.

## HYDRO-ELECTRIC POWER PLANT OF THE INLAND EMPIRE SYSTEM

A large hydro-electric generating station has just been completed by the Spokane & Inland Empire Railroad Company at Nine-Mile Bridge, below Spokane, on the Spokane River. The power plant is connected with the railroad company's distribution center in Spokane by a new high-tension transmission line. The site on which the plant is built is about 13 miles distant from Spokane, where the river passes through a granite rock canyon. The new plant on July 26 began supplying energy to the Spokane & Inland Division of the Inland Empire System. This division comprises about 130 miles of well-built track with cars and locomotives fed from a catenary supported trolley distributing single-phase current. The new plant also furnishes current for lighting the town of Rosalia, Wash., and by the attendant increase in generating capacity the company is in a position to sell additional power at several points along its lines.

The actual work of constructing the plant began in July, 1906.

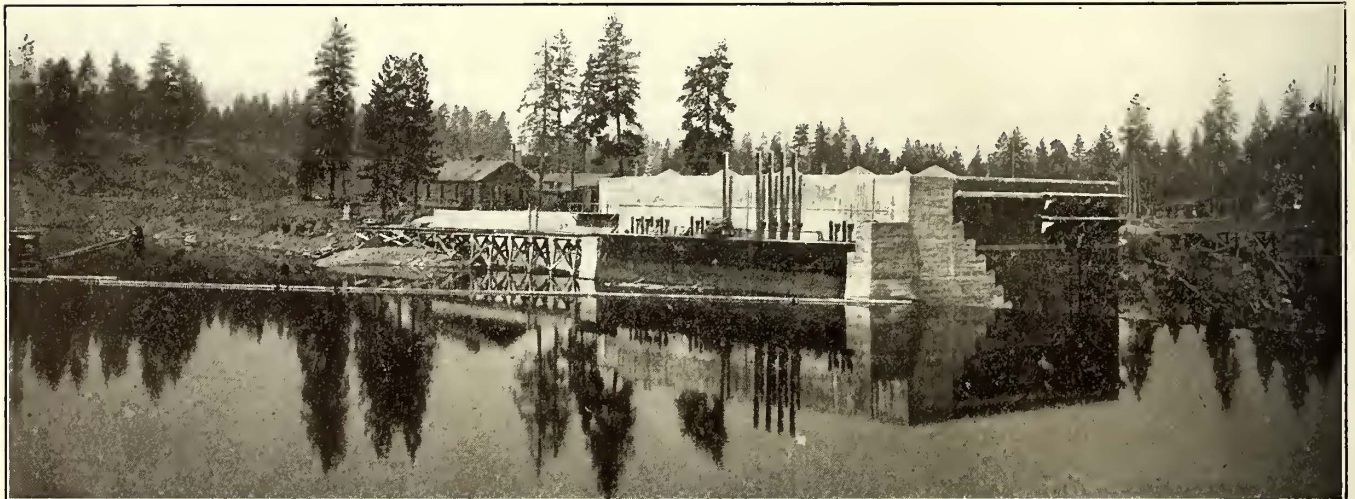
### GENERAL FEATURES OF DEVELOPMENT

The method selected for this development was to dam

four units of 5000 hp each, nominal capacity, so that three of these units could be operated at any one time and the fourth unit could be kept as a spare. This would afford a peak-load capacity of upward of 15,000 hp or for a three-hour to five-hour run the plant could easily carry 18,000 hp, provided the daily load factor was not over 60 per cent, the overload capacity of the units being measured by the capacity of the water wheels rather than the capacity of the generators. The water wheels attached to each unit will generate under a 58-ft. head 6850 hp, which, allowing 93 per cent efficiency for the generators, and with the transformer and wiring losses, means an electrical output from the station of 6000 hp per unit.

From these quantities it can readily be seen that under normal working conditions the capacity of this plant for maximum loads, using a 60 per cent daily load factor, is conservatively estimated at 15,000 hp, and that the plant actually will carry a load of between 17,000 hp and 18,000 hp; while if the daily load factor is as high as 70 per cent, the plant will carry 15,000 hp at the peak-load periods.

In making the above estimates everything has been based on the Government gage readings at Spokane. The plant, however, is located about 15 miles, as the river runs, below this gaging station, and additional water comes



Hydro-Electric Plant of the Inland Empire System—View Looking Upstream

the river at a point in the canyon, using the power house as a part of the water-stop. The power house was placed in the deepest part of the river against the west bank and a water-stop wall at a proper elevation was extended up the west bank. The dam proper was placed between the power house and the east bank. The location of the dam on the east side was selected because the river was shallowest on this side. The west side was selected for the power house, for the reason that, being the deepest part of the river, the river bed made a natural tail race for the water. The length of the pond or lake formed by the 58-ft. dam is 5.1 miles, as measured by the river center line.

Sanderson & Porter, New York, were employed as constructing and designing engineers and William F. Zimmermann was employed as consulting engineer. F. M. Sylvester was engaged by Sanderson & Porter to act as local manager and he had immediate charge of the construction work.

### WATER CAPACITY OF SPOKANE RIVER

A careful study showed that the average flow of the river could be maintained at 2100 s. f., as noted by the Spokane River gagings, therefore it was decided to install

into the river between the gaging station and the power plant. This extra flow appears to be not less than 300 s. f.

### DAM

The dam is built of what is known as cyclopean masonry; large blocks of granite rock, well washed before going into the work, were placed on the concrete and wet concrete slushed around them, well tamped, no two pieces of stone being allowed to touch. Before beginning the construction of the dam, the surface of the granite rock river bottom, on which the dam rests, was excavated and all the soft or imperfect rock removed. A trench about 6 ft. x 6 ft. extending the full length of the dam was excavated under the upstream face of the dam; this was filled with concrete and forms a water stop, and a 6-ft. step was left at the downstream side, which the dam rests against and which would effectually prevent any downstream movement.

Between the downstream excavation and the upstream trench, these two points representing the width of the dam, the surface was left saw-toothed so as to offer the greatest possible bond for the concrete and assist in making the lower bond of the dam to the rock impervious to water.

The upstream face of the dam is nearly vertical and

the downstream face, or water shed, is S-shaped, giving the water a horizontal discharge about 4 ft. above the bedrock.

The dam is separated from the power house by an expansion joint; there are also two expansion joints in the dam proper, about 70 ft. apart. Pitch is used in the expansion joints to prevent seepage. The dam is well drained, vertically and horizontally, drains being placed near the upstream face, which drains lead to the main drain, discharging at the downstream foot of the dam. These drains will take any water that comes through the face of the dam and give it a natural outlet and thus relieve the dam from any floating effect due to water.

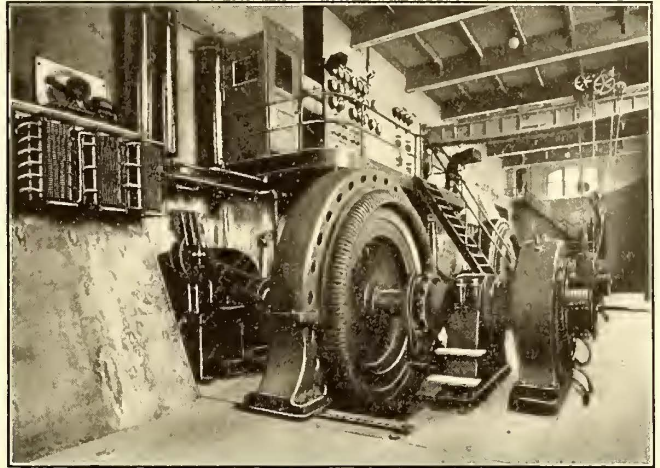
The principal dimensions of the dam are: Length of crest or spillway, 225 ft.; height above tail race, low water, 58 ft.; width at the bottom, 66 ft. 6 in., and area of section, 323 sq. yd.

#### MACHINERY

The turbines are Hercules water wheels fitted with wicket balance gates and were built by the Holyoke Machine Company, Worcester, Mass. There are two turbine units, each unit consisting of four 42-in. wheels mounted on a horizontal shaft and arranged in pairs, with a central discharge draft tube for each pair. Each unit is capable of developing 6850 hp at full gate openings with 58 ft. head and 5500 hp at 50 ft. head when operating at a speed of 240 r.p.m. The main shaft on which the first set of runners is attached is coupled direct to the generator shaft, passing through a stuffing box in the bulkhead between the dynamo room and the turbine chambers. This shaft is 11 in. in diameter at the generator end, 35 ft. 1½ in. long

ported by journals, one at each end of the casing, and by a center bearing supported from the top half of the casing; the thrust bearing forms the support for the main shaft at the bulkhead end.

The wicket gates are supported from the casing by steel pins or journals and are operated by a steel ring which turns concentric with the main shaft and is moved through mechanism by the governor shaft. The water pressure



Hydro-Electric Plant of the Inland Empire System—Generator Room

against the gates is partly counterbalanced to relieve the work to be done by the governor, but the tendency of the gates is to close at all points, so that if anything should happen to the governors by which the pressure should be

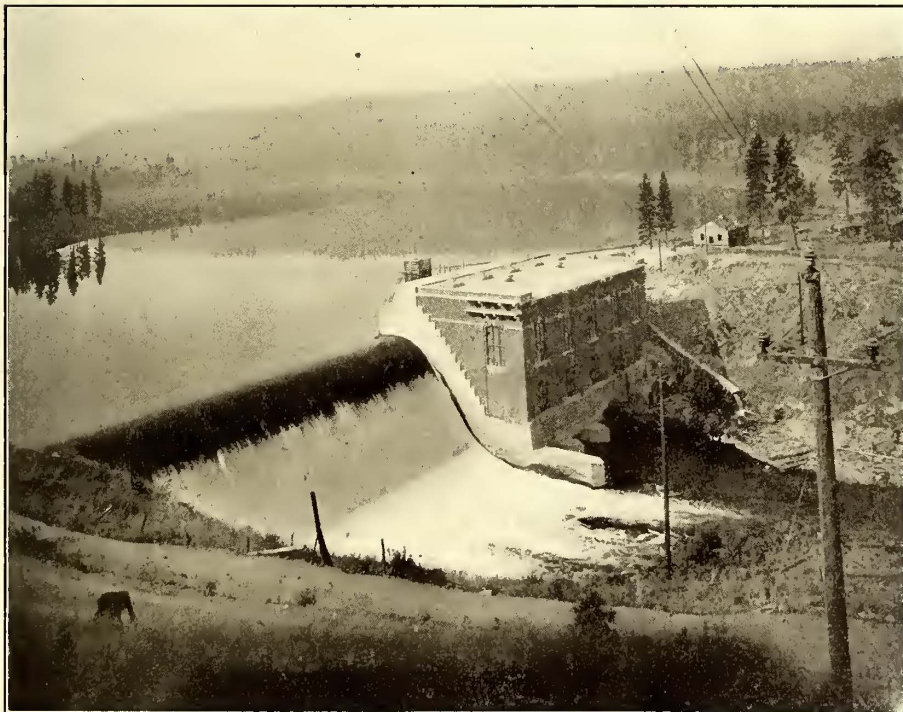
relieved, the gates would close themselves. All the journals of the shaft transmitting the power are adjustable, both vertically and horizontally. The turbines have an efficiency of 77 per cent at full water; of 82 per cent at seven-eighths water; 82 per cent at three-fourths water, and 80 per cent at five-eighths water, so that when operating at the average load, the turbines will be worked at their maximum efficiency.

The governors are Lombard Type N. Under operating conditions they will control the speed within 1½ per cent; they are provided with an electrical adjusting device, so that the operator at the switchboard can adjust the speed of the machines from the switchboard when synchronizing.

The generators are of the revolving field engine type, 3750 k.v.a., 2200 volts, three-phase, 60 cycles. When operating at their full load for 24 hours with 85 per cent power factor, the rise in temperature would

be 50 deg. Cent. The exciter is an engine type, six-pole, 110-kw, 250-volt, shunt-wound machine; the armature is placed on the main generator shaft just outside of the outside bearing, and each machine is large enough to excite two generators under all conditions.

The rotating element of the generators weighs 44,800 lb., turns 240 r.p.m. and the radius of gyration is approximately 3 ft. 6 in., making the flywheel effect approxi-



Hydro-Electric Plant of the Inland Empire System—General View

and is made of nickel steel. Although the turbine runners are rights and lefts and, therefore, are balanced, there is a thrust bearing just outside of the bulkhead to take up any inequalities that there may be between the pairs of turbines. To this main shaft is coupled a second shaft, on which are the second set of runners; this shaft is 9 in. in diameter and 20 ft. 2 in. long. The runners operate in cast-iron cases and the shaft carrying the runners is sup-

mately 574,400 lb. at 1 ft. radius. The leads from the generators pass under the dynamo-room floor up the downstream wall of the building into the switch room on the floor above, where they connect with the low-tension busbars through a selector switch and an electrically operated oil switch. The floor of the switch room being about on the same level as the top of the transformers, the leads to the transformers pass from the generator leads through an electrically operated oil switch, protected by selector switches under the floor directly to the transformers, the current then passes from the transformers through the large openings through selector switches and high-tension oil switches to the high-tension busbar, thence out of the top of the switchboard room, low equivalent lightning arresters being connected at the outgoing point. No high-tension wire is nearer than 2 ft. to any other high-tension wire and in most places not nearer than 3 ft.

The switchboard gallery, or what might be called the master board, is placed in the center of the generator room on the center upstream buttress wall, about 12 ft. above the generator-room floor. From this point the operator can see all of the machinery in the generator room. The

throw disconnecting switches for the generators and transformers.

Four 50-amp, 60,000-volt, three-pole, single-throw, electrically operated oil circuit breakers.

Thirty 50-amp, 60,000-volt, single-pole, single-throw knife-type disconnecting switches for the transformer lines and lightning arresters.

Three 2000-amp, 2300-volt, single-pole, single-throw disconnecting switches for the low-tension busbar.

Three 100-amp, 60,000-volt, single-pole, single-throw disconnecting switches for the high-tension busbars.

One three-pole, 2300-volt mechanically operated oil switch for the water rheostat.

There are also mounted on this floor six 60,000-volt lightning arresters, oil-immersed choke coils and series coils for the switchboard instruments.

The high-tension wiring on this floor is all of No. 2 medium hard-drawn copper, supported on high-tension insulators manufactured by the Locke Manufacturing Company.

The switching arrangements are designed so that the station is operated on the unit system. Connections, however, are made so that through the busbars any transformer can be connected to any generator and any transformer can be connected to any set of outgoing transmission lines.

All the iron work, including the iron cases of all the apparatus installed in this station is permanently grounded.

There is a water rheostat of sufficient capacity to carry the full load of the generators, built on the west pier in the tail race. With this rheostat the operator may, in case the governors fail to work and the machines run away, throw a full load on them to hold down the speed. This feature has been provided as a precaution, although the generators are built to withstand the runaway speed of the wheel under any load which is about 50 per cent above normal.

The transformers are three-phase, oil-insulated, water-cooled, and have

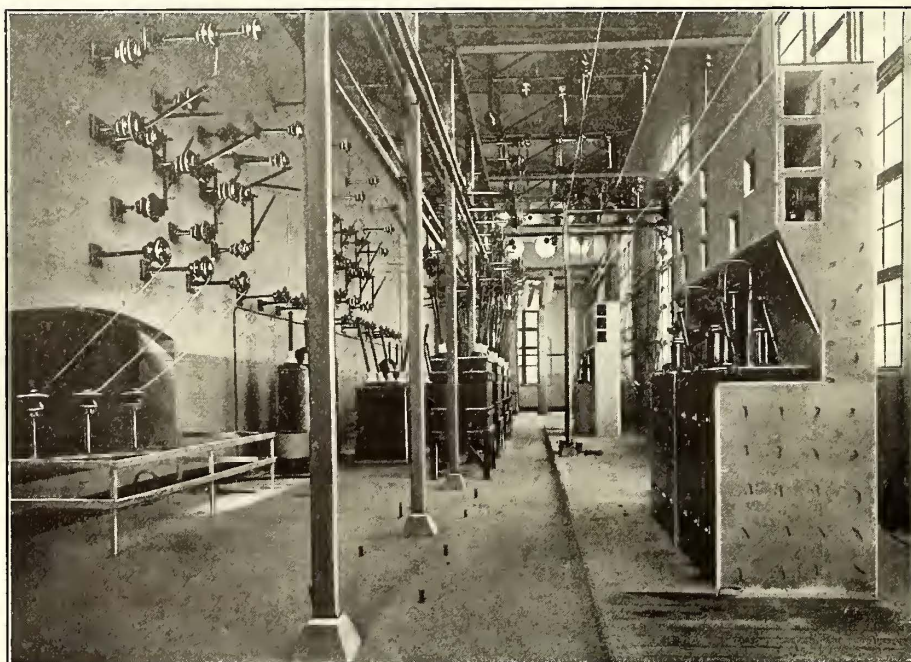
the same capacity as the generators at the same rise in temperature. They are connected delta-to-star, the outgoing transmission system being star connected with a grounded neutral. They are built in iron cases holding the oil, and have the following characteristics:

Load.	Per cent efficiency.
1/4	95.1
1/2	97.1
3/4	97.55
Full	97.65
1 1/4	97.6

With a constant voltage impressed on the primary and with full load thrown off, the regulation will be:

- For 100 per cent power factor, 1 1/2 per cent.
- For 80 per cent power factor, 3.7 per cent.

Before leaving the factory the insulation between the high- and low-tension windings and iron was subjected to a test of 120,000 volts a.c. for one minute, and the insulation from the low-tension winding to the iron to a test of 10,000 volts a.c. for one minute. The approximate weight



Hydro-Electric Plant of the Inland Empire System—High-Tension Chamber

switchboard is of blue Vermont marble; the two main panels each control one generator, one bank of transformers and one outgoing transmission line. At the east end of the board is mounted a swinging bracket which carries a single-phase synchroscope and a 3000-volt voltmeter. There are also two panels which control the exciters and a lighting and power panel board for the station and grounds.

On the buttress walls next to the one on which the switchboard gallery is supported, to the right and left of the switchboard gallery, the electrically operated rheostats are mounted. The switch compartment above the generator room and the electrically operated machinery controlled from the switchboard, includes the following for the control of the generator circuits and the outgoing circuits:

Four 1200-amp, three-pole, single-throw, 2300-volt, electrically operated oil circuit breakers.

Twenty-four 1000-amp, 2300-volt, single-pole, single-

of the transformer when in operating condition is 42,000 lb.

All of the electrical apparatus in the station was manufactured by the Westinghouse Electric & Manufacturing Company, Pittsburg, Pa.

There is a small storage battery, consisting of 125 cells, charged by a 2-kw motor-generator set, which operates the solenoids of the electrically operated circuit breakers and switches. These instruments operate with approximately 200 volts and as the exciter voltage is controlled by Tirrill regulators and the speed of the generators, it was considered advisable to install a storage battery independent of the generators to operate the switches. The storage batteries are located in a concrete vault-room under the driveway approach to the gantry floor. The storage battery was furnished by the General Storage Battery Company, New York.

#### POWER HOUSE

The power house is located between the dam and the west bank of the river in the deepest part of the river and occupies a space approximately 116 ft. 6 in. over all up- and downstream by 139 ft. 8 in. across the stream, or east and west, and from the lowest point of the foundation to the roof is approximately 120 ft. high. The building is entirely fireproof, with the exception of the doors and windows, which are wood. The structure is built of concrete and cyclopean masonry, with the exception of the downstream side above the foundations and the east and west walls above the buttress walls, which are brick. In all of the upstream walls and wherever strains other than purely compression strains are to be resisted, the concrete is reinforced with twisted steel bars and it is to be noted that thus far absolutely no cracks of any kind have developed in any of the walls.

Wherever weight only was needed or wherever it was necessary to fill a space or provide for foundation walls, cyclopean masonry was used. The granite rock for such masonry was taken from the excavation work or from a quarry adjacent to the plant. Before beginning the foundation of the building all questionable rock in the river bed was removed. In places it was found necessary to go to a depth of 12 ft. or 14 ft. lower than was originally planned.

The water pressure against the upstream face of the power house is resisted by five buttress walls that extend from the water-stop wall at the upstream side of the building and from the top of the building down to the lowest downstream point, these buttress walls forming the dividing walls for the tail water. These buttresses are 12 ft. thick and the spaces between them are 15 ft. wide or the buttress walls are 27 ft. center to center. Between the buttress walls are the turbine chambers at elevation 13, the transformer rooms at elevation 34.6, and between these walls, extending from the turbine chamber floor to the tail race are the two sets of draft tubes, built in a solid mass of concrete. The upper discharge point of the draft tube is 7 ft. below low water in the tail race, so that the draft tubes are always water-trapped.

At the upstream side of the building, extending the full length of the building and from elevation 53 to 87, or 34 ft. averaging about 16 ft. in thickness, is a solid concrete wall, supported by the buttress walls, which not only acts as a water-stop, but adds about 4000 tons to the building at a point where it is most effective for stability.

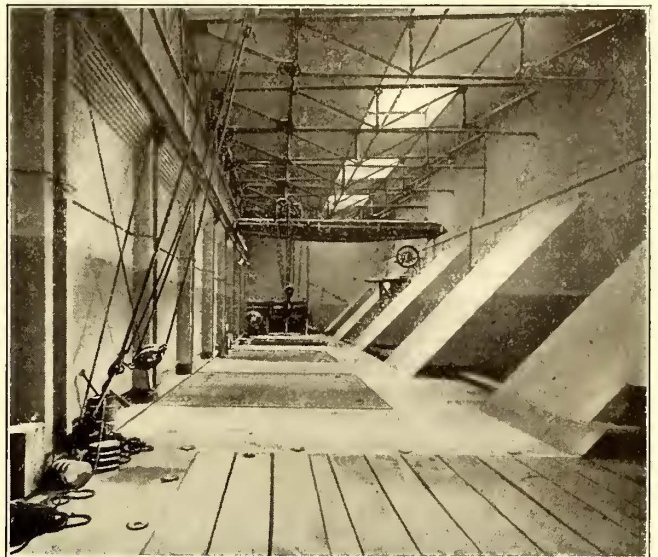
A set of heavy iron trash racks are placed ahead of the gates, through which all the water must pass before it gets to the head gates; these racks extend the entire length of the building. The gates are of wood and handled with a

single stem to each gate. There are four gates to each unit covering openings 4 ft. wide x 20 ft. high in the clear, so that when passing 1000 s. f. of water, or each unit is developing 5000 hp, the water velocity through the gate openings is only about 3 ft. per second. The water velocity of discharge of the tail water is figured at the same rate, viz., 3 ft. per second.

The turbines are placed in a turbine chamber, the floor of which is at elevation 13. The center line of the turbines is 5 ft. higher, at elevation 18, making the maximum draft 18 ft.

The turbine chambers are accessible from the gantry floor through a large iron door, closed when the chambers are full, over which a traveling crane passes large enough to handle any part of the turbines. There is also provided a manhole through this door and a manhole in the bulkhead plate into the dynamo room. Through these openings a man can pass for inspection or to do any light repair work.

The transformer rooms occupy the space between the buttress walls and extend from elevation 34 to the gantry floor at elevation 56. A traveling crane of 10 tons



Hydro-Electric Plant of the Inland Empire System—  
Gantry Room

capacity covers the turbine and the transformer rooms.

The gantry room or floor extends the full length of the power house and is 32½ ft. wide, the floor being at elevation 56. A traveling crane covering the full width of this floor has sufficient capacity to handle any piece of machinery in the building; this crane not only covers the turbine chambers and transformers, but also the opening or well into the generator room, so that by means of it any piece of machinery can be lowered into or taken out of the generator room. At the west end of the gantry room are large doors to the driveway which is used for bringing material to the building.

The building is divided lengthwise by a solid brick wall between the gantry room and the switch room; the gantry room is on the upstream side of this wall and the switch room on the downstream side. This wall also forms the downstream wall of the transformer rooms and an opening through this wall between the transformer room and the switch room allows the high-tension wires to pass from the transformers to the high-tension switches.

The switch room is directly over the generator room and extends the entire length of the building. It is 29 ft. 8 in. wide in the clear and 37 ft. high (the floor being at

elevation 45.6) to the roof of the building. All of the switching apparatus is placed in the switch room, including lightning arresters, choke coils, series coils, high and low-tension oil switches, selector switches, etc. All these switches, with the exception of the selector switches, are operated from the master board in the generator room below.

The generator room extends the entire length of the building and is covered by a traveling crane large enough to handle the heaviest piece of the generators. The floor level is 14 ft. higher than the tail water and 4 ft. higher than the highest estimated water in the tail race during flood periods.

The river is very deep for a considerable distance downstream. There is no danger, therefore, from backwater due to log jams, but to provide against this emergency a concrete wall 11 ft. above the dynamo room floor extends around this room, and pumps are provided to pump from sunk wells in case water should come in on this floor.

Ample drains are placed through the concrete walls so that there will be no accumulation of water anywhere in the building. The roof of the building is steel framed, filled with concrete and made waterproof, with a covering of malthoid roofing, copper flashed. The downstream side and east and west sides of the building above the concrete and also the middle wall of the building above the concrete are steel framed, the steel work being heavy enough to carry the cranes, and the filling is of brick.

The coping and the eaves of the building are of concrete block. There was no particular attempt at ornamentation. The building, however, is well proportioned, presents a pleasing appearance, and is a good example of a building used for industrial purposes.

### BEAUTIFYING GROUNDS NEAR SHOPS AND OTHER RAILWAY BUILDINGS

An article in the *ELECTRIC RAILWAY JOURNAL* of Sept. 12, 1908, page 628, directed attention to the work of the Brooklyn Rapid Transit Company in improving the grounds at its shops by the use of grass and flowers and the erection of a flagpole to support a flag purchased with money contributed by the employees. Inquiries regarding the practice of other companies in this respect were sent by the *ELECTRIC RAILWAY JOURNAL* to various companies, and the replies follow:

C. D. Emmons, general manager, Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind.—We have not yet improved our shop yards in the manner indicated in the account of the work done by the Brooklyn Rapid Transit Company. We have started a movement of this character, however, at our substations and power houses, and expect to extend it to our shop yards. We feel that it is a very important movement, and that the added neatness caused by this class of improvement fully repays for the expenditure required.

Charles O. Kruger, second vice-president and general manager, Philadelphia Rapid Transit Company.—We have not erected any flagpoles at any of the shops of this company, as our shops are entirely in the sections of the city which have been built up, and in every case occupy the full block of a city square. There is, therefore, no opportunity for grass plots, as at the shops of the Brooklyn Rapid Transit Company. I think, however, that we have the cleanest street railway shops of any operating road. We have a system of inspecting and cleaning under which a man is suspended or discharged if his department is not in order at all times.

H. W. Fuller, general manager, Washington (D. C.) Railway & Electric Company.—While we have not gone into the work of improving unsightly places in all our shops and car houses as extensively as the Brooklyn Rapid Transit Company, as indicated by the article in the *ELECTRIC RAILWAY JOURNAL* of Sept. 12, still we have insisted for a number of years on maintaining the lawns in front of our various properties in good condition and cleaning regularly all storage yards, with the idea that by doing so we were performing not only a duty to the city and property owners in the vicinity of our various properties, but that these betterments had a tendency to elevate the employees.

Charles N. Black, vice-president and general manager, United Railways of San Francisco.—Owing to the damage caused by the earthquake and fire in San Francisco in the spring of 1906, it has been impossible for this company, up to the present time, to attempt anything in the direction of beautifying the places around its shops and car houses.

F. W. Brooks, general manager, Detroit United Railway.—Wherever the conditions will permit, we follow the practice of making a lawn and keeping it in first-class condition. Shrubs and flower beds are maintained at some of our stations, and where conditions will permit we have also set out shade trees. A number of our car stations are covered with vines. It is our definite plan to beautify our grounds in this way whenever it can be done.

T. A. Cross, general manager, United Railways & Electric Company, Baltimore, Md.—While we keep our car house properties and land adjacent thereto as free from debris as possible, we have not gone into the question of improving the grounds with grass plots and flower beds.

William J. Hield, general manager, Twin City Rapid Transit Company, Minneapolis, Minn.—Up to the present moment we have been occupied largely with the construction of new buildings and the general improvement of our property, but have not accomplished very much in the way of beautifying the grounds, although we feel that in all probability considerable good would result from such improvement.

Frank A. Davis, president and general manager, Scioto Valley Traction Company, Columbus, Ohio.—It is the general policy of this company to require that all rubbish be burned and all scrap deposited in receptacles furnished for that purpose, and to encourage employees to maintain sod and flower beds at points around buildings that are not needed for other purposes. This has been our general policy since we started operation.

John B. Crawford, general manager, Lexington & Interurban Railway Company, Lexington, Ky.—We have not made any improvements of the nature described, but as soon as our car repair shops are finished we shall take advantage of the idea and erect a flagpole, the flag for which will be furnished by the company.

W. A. Haller, general manager, Mobile Light & Railroad Company, Mobile, Ala.—Our conditions are favorable for effecting improvements of the character you suggest, and we expect to consider this subject early next spring. Our power house and shops are located in close proximity to the park and the baseball park, which will make particularly attractive an improvement of this nature.

It is stated that Baden, Germany, will introduce electric traction on the sections of the State Railway line between Basel and Zell and between Schopfheim and Räckingen. Electric energy will be supplied from special stations to be erected near the Rhine River. Ten 1000-hp electric locomotives have already been ordered.



### REBUILDING NEW JERSEY CARS FOR PAY-AS-YOU-ENTER SERVICE

The Public Service Railway Company of New Jersey is now rebuilding 132 double-end and 175 single-end cars for pay-as-you-enter operation in Newark. In addition, the company has in operation its original installation of 150 new cars recently purchased from the Cincinnati Car Company. As the cars to be converted embrace several classes

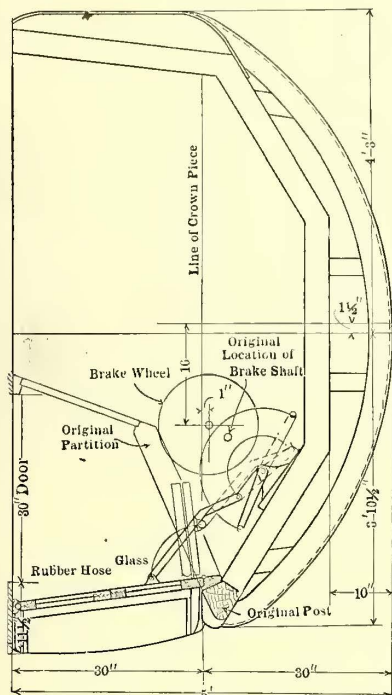


Fig. 1—New Jersey Pay-As-You-Enter Cars—Rebuilt Motorman's Platform of Single-End Car

of construction and equipment, it was found convenient to lay out the work for the shops in the form of a table, showing the lines to which the cars belong, the class numbers, whether single or double-end, and if the cars have either storage or independent supply air brakes. Owing to the diversity in designs and physical condition of the individual cars, the changes made differ somewhat in character and extent, although employed for the same operating method. It may be best, therefore, to describe the changes

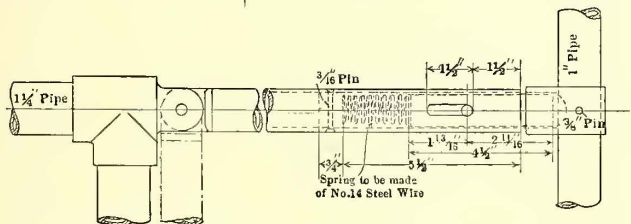


Fig. 3—New Jersey Pay-As-You-Enter Cars—Spring Trigger for Dropping Platform Railing

on one class each of the single and double-end cars, mentioning where necessary that certain of the features are applicable to all the types.

#### SINGLE-END CARS

The body length of all cars, whether single or double-end, remains the same. In the class 1600 single-enders, the double-sliding doors at the conductor's end have been removed to make way for a swinging entrance door and a

sliding exit door controlled by the conductor. The entrance door is 24 in. and the exit door is 28 in. wide. The latter dimension is 2 in. less than the exit on the new pay-as-you-enter cars. The front exit is 30 in. wide. The over-all width of the 1600 type cars is 8 ft. 2 1/2 in., and the body length 30 ft. 8 in., while the 150 new pay-as-you-enter cars are 8 ft. 6 in. wide.

The front platform retains its original length of 5 ft., no important structural changes being required beyond the removal of the motorman's partition and the installation of a 30-in. wide double folding door at the step. This door is controlled by the motorman through a lever. The

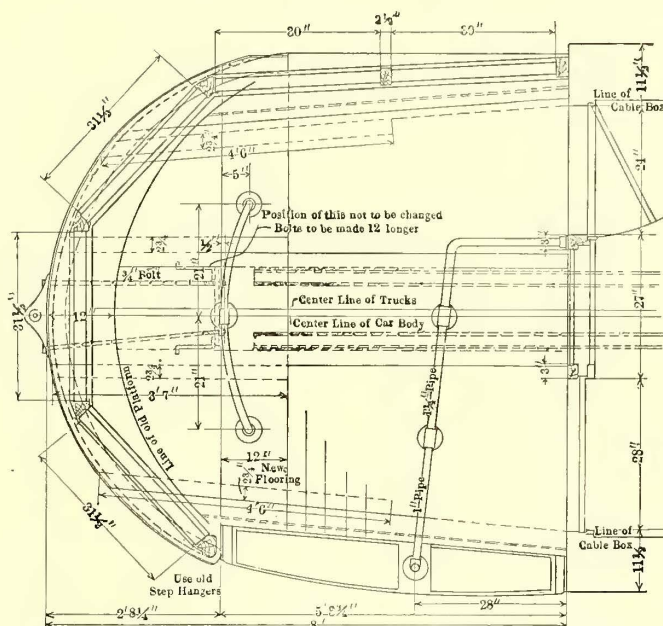


Fig. 2—New Jersey Pay-As-You-Enter Cars—Rebuilt Conductor's Platform, Showing Exit and Entrance Doors, Railings, Etc.

double folding door made it necessary to shift the position of the brake staff, as illustrated on the plan of the platform, Fig. 1.

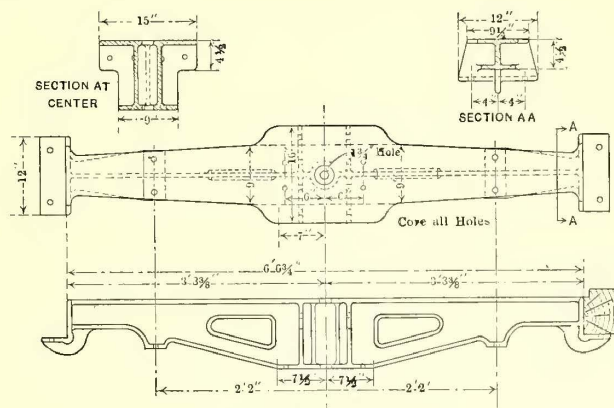


Fig. 4—New Jersey Pay-As-You-Enter Cars—Cast-Steel Body Bolster

The conductor's platform, as shown in Fig. 2, was originally of the Detroit type, and has been lengthened 12 in., making it 8 ft. over-all. This slight increase in length required only the splicing of the old platform knees and sills. The new flooring was inserted opposite the end of the second step, thereby pushing back the old dash and bumper to their present positions. The original draw-bar attachment was retained, simply by using bolts 12 in. longer. The hood of the car was also extended the necessary dis-

tance by filling in at the bulkhead. The step is carried on the original hangers and is divided by the main platform railing to prevent interference between incoming and out-

going passengers. This is probably the first instance in the United States of extra-fare collection on pay-as-you-enter cars.

DOUBLE-END CARS

The body arrangement of the double-end cars in classes 1500 and 1700 is similar to that of the single-end type. Part of the work on many of these cars has been the replacement of old wood-filled bolsters by the cast-steel bolster shown in Fig. 4, which has been made standard for all new cars. The shape of the casting has been designed to secure both strength and convenience in the installation of braking levers, air pipes, etc.

The original platforms were of the full vestibule type and have been lengthened from 6 ft. 0 in. to 7 ft. 10 in.

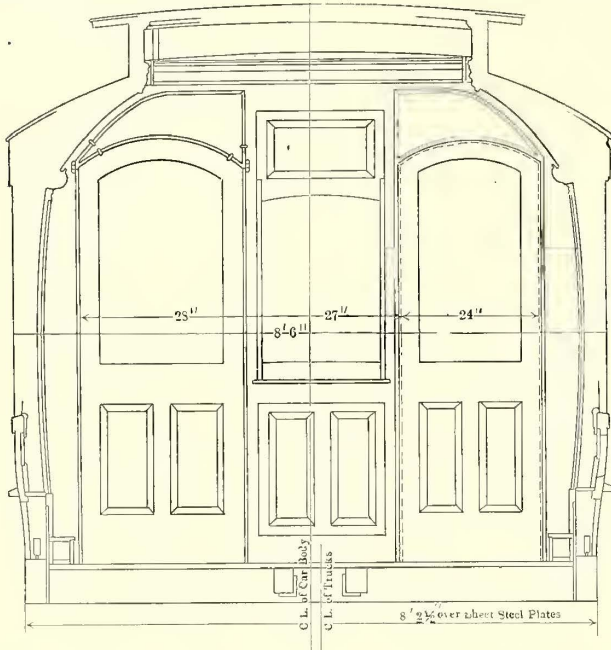


Fig. 5—New Jersey Pay-As-You-Enter Cars—Entrance and Exit Doors

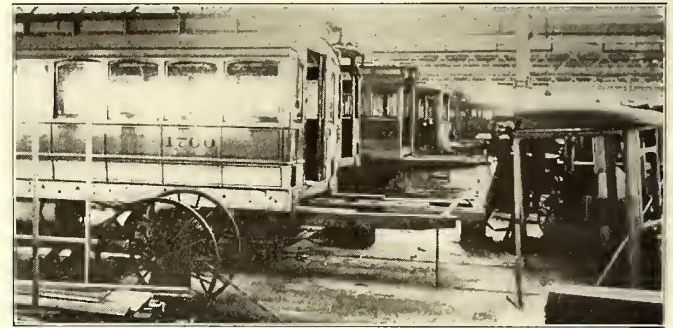


Fig. 6—New Jersey Pay-As-You-Enter Cars—Rebuilding Platforms in the Plank Road Shops

going passengers. The horizontal portion of the pipe railing has a tongue normally projecting into the vertical platform rail, but by pushing back a spring trigger, as shown in Fig. 3, it may be dropped parallel to the step rail. This feature, which is applied to all the rebuilt cars, is of value in cases where the maximum unloading ability is desired, as at terminals and parks.

This increase in length made it necessary to install new platform knees and posts at both ends. According to the plan, Fig. 7, and half-toned, Fig. 6, the inner side of the

The only important change in the car wiring was the installation of a push button circuit with a buzzer at each end of the car. The prepayment cars are made known to the prospective passenger by a conspicuous black-bordered shield painted in Tuscan red on the yellow dasher and lettered "Pay-as-You-Enter" in aluminum. The last panel of the car also carries the sentence "Have Your Fare Ready, Please," and the steps bear the usual signs, "Entrance" and "Exit."

Passengers enter freely through the inward-swinging door on the side farthest from the step. The sliding exit door is opened by the conductor through a platform lever. Fares collected may be registered either by pressing a pedal which pushes down a lever attached to the register, or by pulling a short register strap and rod directly overhead. This method of registration will be installed on all the cars.

Twenty rebuilt cars of class 1600 are now in service on the Montclair 10-cent suburban line. The first fare is taken by the conductor and the second by an inspector, who boards the car at a given point and registers the fares on a separate register

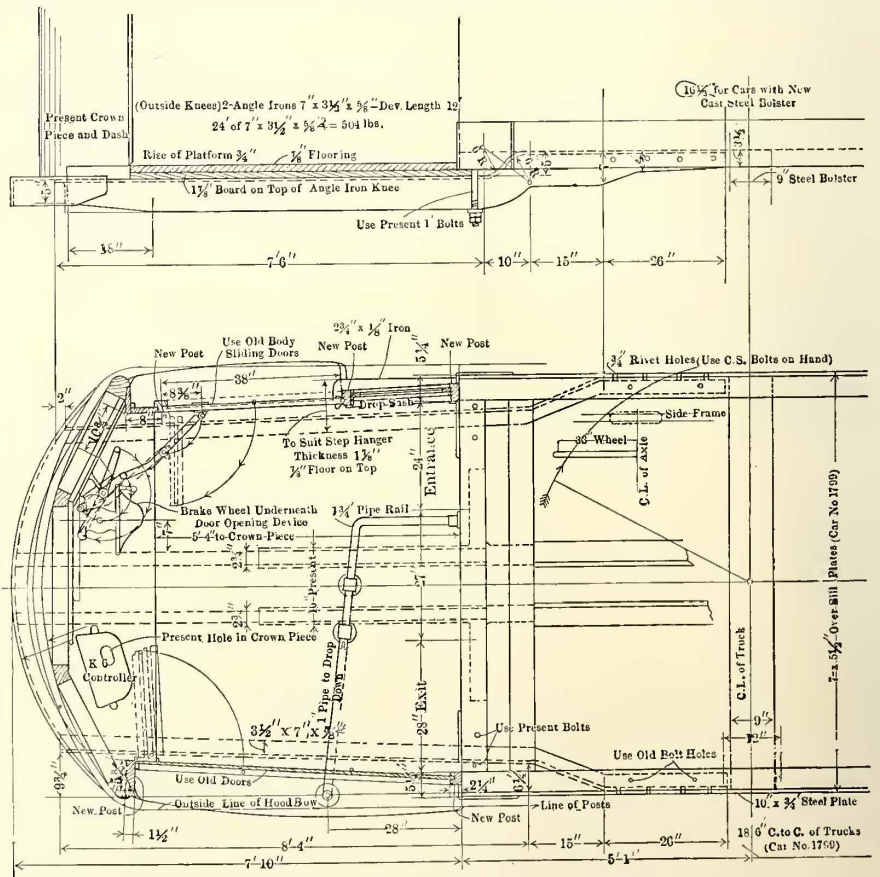


Fig. 7—New Jersey Pay-As-You-Enter Cars—Plan and Section of Platform of Converted Double-End Car

rear platform is composed of one panel with drop sash and a double folding door made up of old body sliding doors. The outer side has a triple door, which is folded

back to back against the controller when this platform is used for fare collection. When the motorman is using this platform the triple door is closed, while the double door used for exit at the front is subject to his control through a handle near the brake wheel. Passengers are not permitted to stand on either platform of these cars.

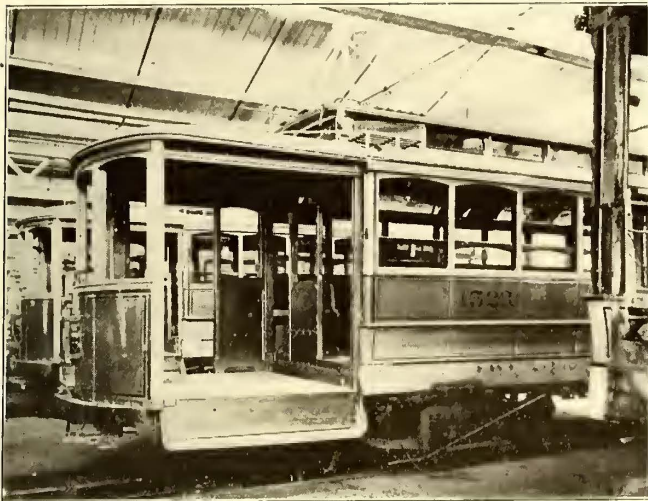


Fig. 8—New Jersey Pay-As-You-Enter Cars—Rebuilt Platform of Single-End Car, Showing Door Locations

The Public Service Railway Company is converting these cars under license from the Pay-as-You-Enter Car Company.

### ELECTRIC TRAVELING CRANES IN CAR MAINTENANCE

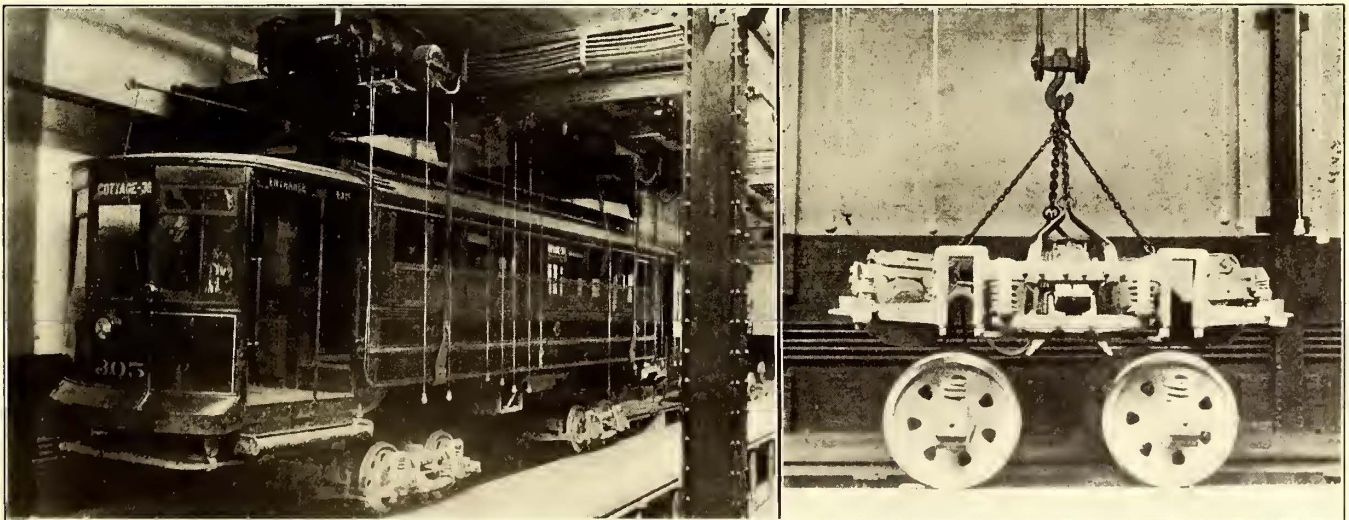
In the *ELECTRIC RAILWAY JOURNAL* for June 20, 1908, an article was presented describing the new Cottage Grove Avenue car house of the Chicago City Railway Company. This car house, which is designed along most approved lines, includes two repair bays. In one of these bays an equipment of shop tools for maintenance work is being installed, and in the second bay two electric overhead cranes have recently been erected and put into service.

The repair bay in the Cottage Grove car house is 50 ft. wide, and is divided in the center by a row of columns which supports the roof. The crane runways are carried on one side by the wall and on the other side by this center row of steel columns. The span of the cranes is 23 ft. and the length of travel about 200 ft. These cranes serve two pit tracks extending under the entire length of the runways, and each crane has a capacity for lifting  $7\frac{1}{2}$  tons. The cranes were supplied by the Whiting Foundry Equipment Company.

#### HANDLING REPAIR WORK

The method of handling repair work at the Cottage Grove Avenue car house, which is several miles distant from the main repair shops, is of particular interest because the work is so planned and executed that the maximum number of cars will be available for the use of the transportation department at all times. Whenever a car is turned in for truck repairs which cannot immediately be made on the car house floor, it is sent to the repair bay and placed on a track under the two cranes. After the motor leads and brake rigging are disconnected, it is but the work of a moment to make the car body ready for raising. A yoke longer than the width of the car hangs from the hook of each crane. These yokes serve in raising the car body by means of stirrups hooking under the sills. While the car is in the raised position the truck needing attention is withdrawn and replaced by a good one from a stock of four kept constantly on hand; then the car is ready for service again. It is stated that a car can be run under the cranes, both trucks, motor leads, brake rigging, etc., disconnected and car body carried forward by cranes, over two repaired trucks, lowered, connected up, and returned to service again in the short space of 40 minutes.

In an article published in the *ELECTRIC RAILWAY REVIEW* for April 4, 1908, the method of handling cars in the main repair shops was described and illustrations were presented showing the record forms used. One of these forms is the so-called "signing-in sheet," on which the motorman, as



Electric Cranes with Car Body Raised for Truck Replacement

Truck Raised for Wheel Changing

The results obtained by the use of these electric cranes are said to show a long step in advance of the former practice at the main repair shops, where hydraulic lifts are used. The accompanying illustrations will serve to present the appearance of the electric cranes when in use raising car bodies and truck frames.

he turns in a car, makes a record of its condition, noting any parts needing the attention of repair men. Having this complete record of the defects which must be made good before the car can be returned to service, it is a simple task for the repair force at the car house to pick out those cars which can be handled most advantageously by the

electric cranes. In addition to the use of the motorman's sign-in sheet for reporting defective cars, the car house inspectors periodically examine all the equipment. Cast wheels are inspected daily for chipped flanges and flat spots. Steel wheels are inspected three times each week, using a templet, which shows the minimum and maximum wear of flange. When the inspectors find wheels worn so that they need re-turning, the number of the car under which these wheels are found is marked up on a car house "held-in" sheet and the car is brought to the repair bay, where the wheels are removed and sent to the shop for re-turning. One of the illustrations shows how simple a task it is to change the wheels in Brill trucks if the electric crane is used to lift the frame and motors off the journal boxes.

All of the wheel maintenance work is done at the main repair shop, so that wheels on their axles must be transported across the city. A special flat car is provided for this purpose. On the platform of the car are double tracks so arranged that the pairs of wheels interlock and thus occupy the smallest possible space. This car will hold 12 pairs of wheels. A regular trip is made between the car house and main repair shop once each day, collecting the worn wheels, carrying them to the shop, and distributing good wheels to the car houses.

#### TRUCK WORK

Besides the wheel work, the new electric cranes are used for motor and truck overhauling. Before the installation

emulsion cleaner, the painting of the exterior metal work, trolley poles and trolley catchers. The car floors also are painted every 90 days.

#### EFFICIENCY OF CRANE WORK

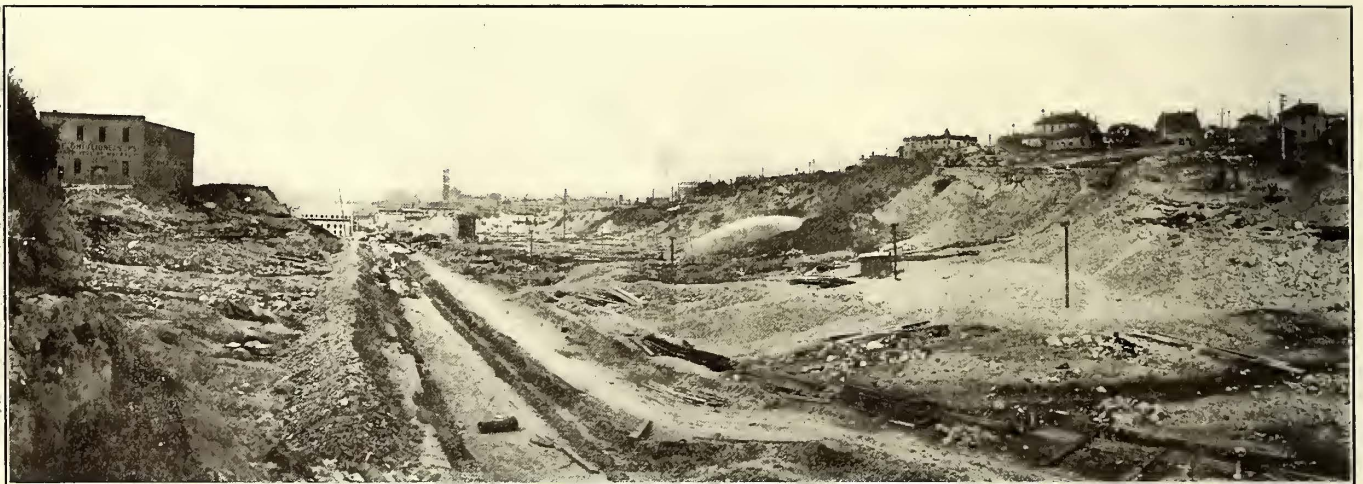
A comparison of the costs of raising car bodies by the use of electric cranes as against similar work with hydraulic jacks, shows a saving of about 35 cents per car body raised. With hydraulic jacks as used at the repair shops the cost of disconnecting motor leads and brakes, raising a body, replacing an old truck with a new one, connecting up the leads and lowering the body, is about 84 cents, while the same work with the electric cranes is but 49 cents. The cost for power is said to be about the same for the hydraulic jacks and the electric crane.

The following statement will show the comparative cost of installing wheels on the M. C. B. type of truck by the use of the electric crane, as against the use of stone jacks:

Wheels.	Stone Jack.	Crane.	Saving.
1 p'r wheels,	2½ h'r at \$1.80.	2 h'r at \$1.60	\$0.11
2 p'r wheels,	3¼ h'r at \$2.75	2½ h'r at \$2.11	0.64
3 p'r wheels,	4¾ h'r at \$3.60	3½ h'r at \$2.95	0.75
4 p'r wheels,	5½ h'r at \$4.65	4 h'r at \$3.38	1.27

#### CHANGING GRADES IN SEATTLE

The accompanying illustration of regrading operations on Jackson Street, Seattle, will give some conception of the great task that city is carrying out in reducing the prohibitive grades. Practically the entire district in which



Changing Grades by Sluicing, on Jackson Street, Seattle

of the electric cranes in this car house, it was necessary to send a car having motors or trucks which needed overhauling to the main repair shop, where a crane was available for handling. The stone jacks used in the car house work would not raise a truck frame high enough to allow the removal of the axles under the outside-hung motors.

Four pairs of extra trucks are kept at the car house. The car house force keeps these extra trucks in good repair, so that when a car comes in with a flat wheel or any other defect requiring truck replacement, a good truck is available and can be put under the car body at once in place of the defective truck. In this way the largest possible number of cars is always available for the use of the transportation department.

The schedules operated from the Cottage Grove car house require 215 cars. The inspection and repair work has been so systematized that only 10 extra cars are required. Of these 10 cars, five are held for the regular cleaning, which includes the periodical application of an

any work has been done is shown in this picture. To date, 1,800,000 cu. yd. has been sluiced into Elliott Bay, which is directly in front. Lewis & Wiley, at present the contractors, are using 25,000,000 gal. of water a day. Their salt water pumping plant furnishes about 12,000,000 gal. every 24 hours, the rest of the water being obtained from Lake Washington or purchased from the city.

During August 7624 cu. yd. of earth were removed. All of the earth has been sluiced down the hill, and the land under the first buildings seen has been filled in to a depth of from 10 ft. to 40 ft. Immediately in the foreground is Weller Street, which has been brought to practically its permanent grade. The street cars now operating on Jackson Street, which is just at the brink of the excavation on the right, are to be placed on Weller Street, so that all the high portions shown in the right of the picture can be sluiced into the bay.

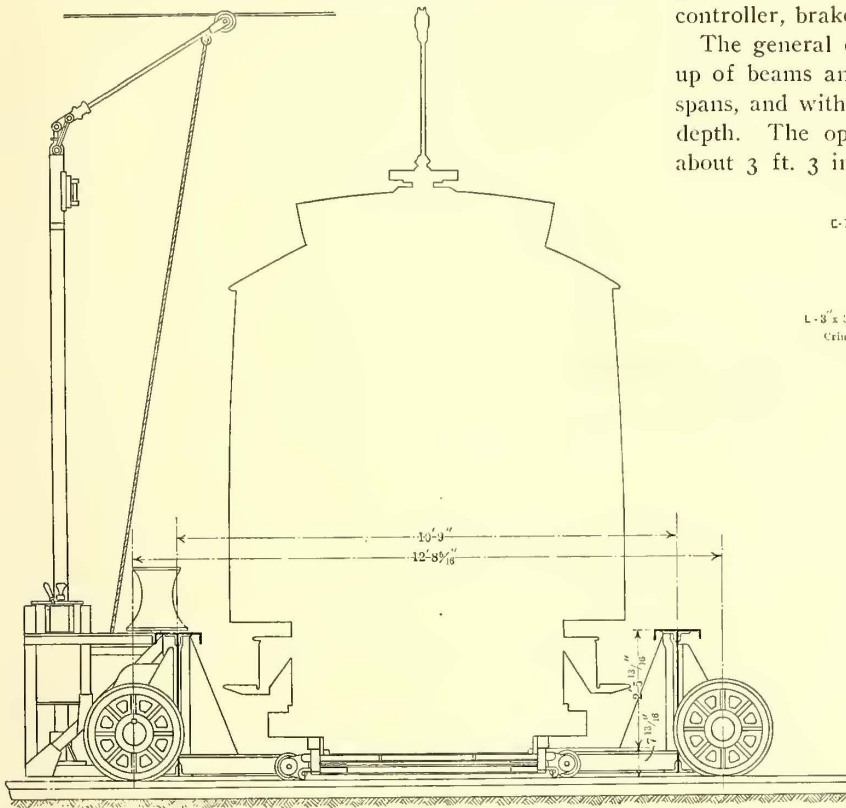
All the buildings in the tract which has been graded were moved up the hill. The district prior to the regrading was thickly built.

**NEW BOSTON ELEVATED TRANSFER TABLE**

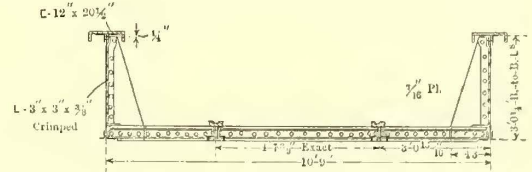
The Boston Elevated Railway Company has recently placed in operation at its Charlestown Neck car house a transfer table of the through girder flush type, capable of

tons, and it will handle a semi-convertible car of 67,000 lb. weight with ease. Current is supplied to the table by a short, flat, spring trolley pole, mounted on top of 3-in. wrought-iron mast, 13 ft. long, and an operating platform is provided at one side on which are mounted a rheostatic controller, brake and clutch levers.

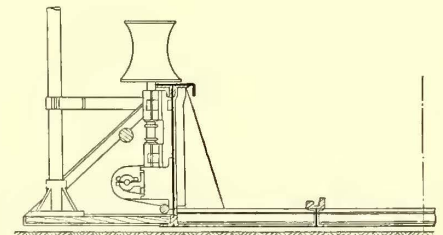
The general design of the table is that of a floor made up of beams and stringers, with diagonal bracing between spans, and with sides composed of through girders 3 ft. in depth. The operating platform is supported on a frame about 3 ft. 3 in. by 5 ft. 7 in. dimensions. Two lines of



End View



Enlarged Section of Table



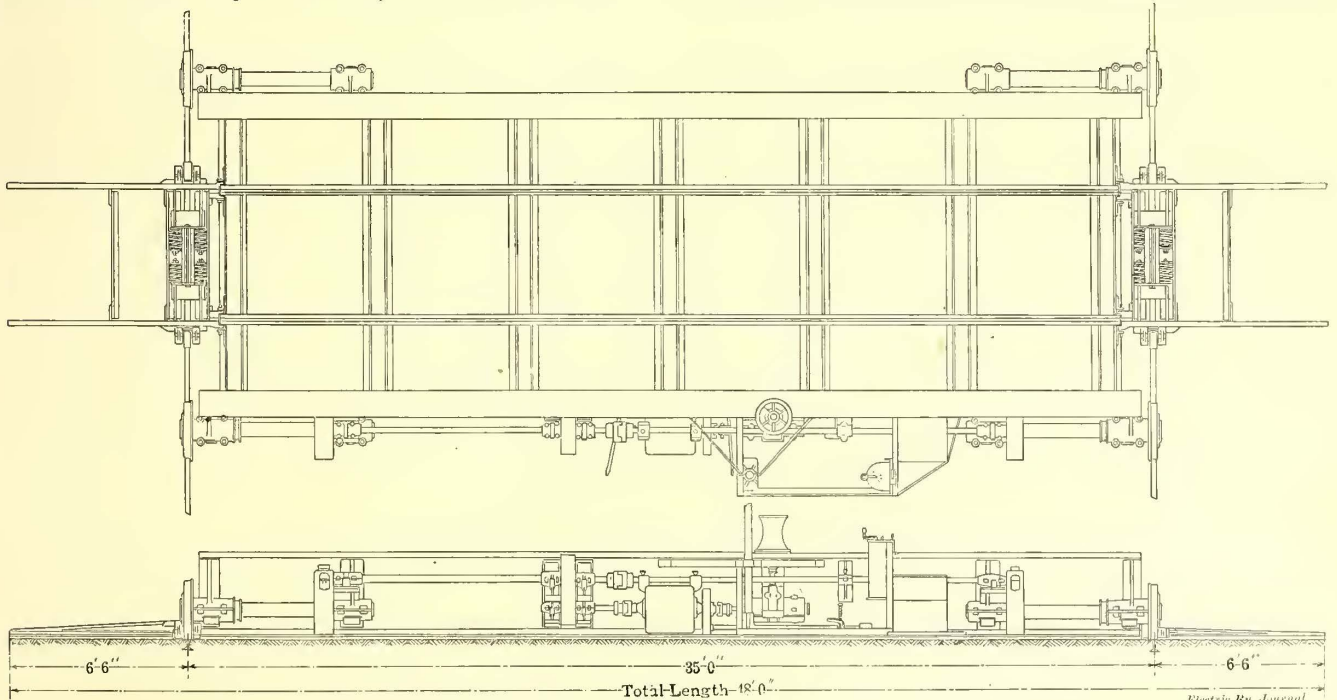
Section through Operating Platform

*Electric Ry. Journal*

**Flush Transfer Table at Boston—Sections**

handling the largest cars in use on the surface lines. The table was built after plans made by the company, and has

stringers are provided, the distance between centers being 4 ft. 7 3/8 in. The track rails are carried directly on top of



**Flush Transfer Table at Boston—Plan and Side Elevation**

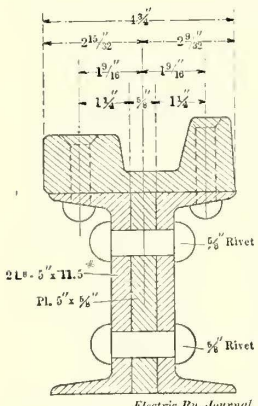
*Electric Ry. Journal*

a total length of 48 ft. Its width is about 12 3/4 ft. between centers and it is operated by a 575-volt direct-current series-wound enclosed Crocker-Wheeler motor, whose normal speed is 575 r.p.m. The weight of the table is about 20

these stringers. The span between floor beams averages 5 1/2 ft., seven beams being installed from end to end of the table. The rail section used is the Lorain Steel Company's No. 215, weighing 60 lb. per yard. The rails are riveted to

the channel flange and are of the stringer section, as shown in the accompanying illustration. A typical section of the table is also shown. The clearance above the floor is about 2 in.

The table is equipped with a winch by means of which cars can be operated upon the table when without power of their own. The driving of the table is effected through spur gearing, two of the wheels being operated as drivers. Clutches provided on the table near the controller platform enable the motor to operate either the transverse movement of the table or the winch. The wheels are each 24 in. in diameter, of chilled cast iron. The brake is of the friction band type, operated by a foot lever, and an automatic gong is installed for operation by a cam on the driving shaft. A somewhat similar transfer table was designed by Nicholas Brothers, Chicago, some time ago, for the Chicago City Railway Company, and has been put in use by that company.



**Boston Transfer Table—  
Section of Rail**

**A TRAIN ANNOUNCING DEVICE**

BY F. VAN Z. LANE, C.E., ASSISTANT ENGINEER IN CHARGE OF TRAFFIC, DEPARTMENT OF BRIDGES, CITY OF NEW YORK

A train announcing device has recently been installed in the Manhattan elevated train terminal of the Brooklyn Bridge by the Department of Bridges of the City of New York, that adds materially to the convenience and comfort of waiting passengers and facilitates the loading of trains.

As is generally known, the layout in this terminal provides three island platforms, which in the evening rush hours are used as loading platforms, with at least two lines loading from each platform. This fact, together with the exigencies of the situation, prohibits the possibility of determining that trains will load from the same side of their respective platforms at all times. There existed, therefore, the uncertainty of waiting passengers as to which side their train would load from and gave rise to great confusion when the passengers for one line would distribute themselves on one side of a platform only to have the train come in on the other, or when everybody would congregate in the center of the platform and endeavor to separate themselves from the passengers of other lines to get ready to board the incoming train.

To prevent this confusion and crowding, it was necessary to give prospective passengers as much advance information as possible as to which side of the platform their

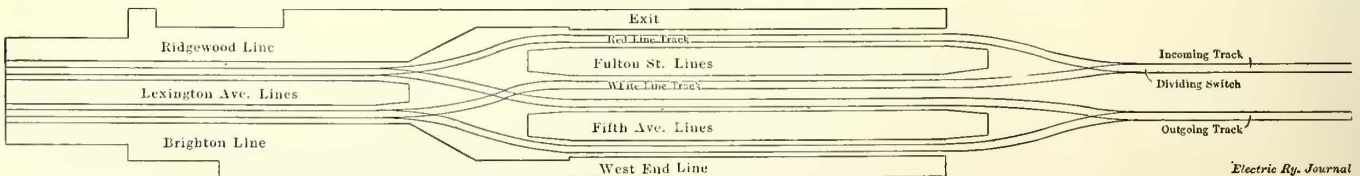
are out of sight and when up display the name of the line being announced with a pointing hand at the end.

The semaphore rack is located in the center of the platform, so that the side on which the arm appears and to which the hand points indicates the side from which the train will load. The sign also announced the destination of the train. The man working this device, however, did not know any more than a waiting passenger which side a train would load from until it approached the platform. The device installed gives this advance information to the announcer at the semaphore arms by informing him as soon as it is known on which track a train will enter the station, and this information displayed at once gives the waiting passengers as much time to arrange themselves as it will take the incoming train to enter the station, unload and be switched to its proper loading platform. This time is considerable.

The dispatcher, who has absolute control of the train operation in the station, is the first one who knows on which side a train will enter the station by virtue of his location at the entrance to the station and of his duty in throwing the dividing switch from the incoming main line; and a train having entered the station on one side, either the north or south track—or, to better distinguish them, the red or white line—it must of necessity stay on that side until it leaves the station. All that was necessary, therefore, was to install some means of communication between the dispatcher's office and the semaphore men on the platforms that would be instantaneous, easily interpreted, convenient and reliable, and waiting passengers could be given sufficient time to arrange themselves for the incoming train, and so do away with all crowding and confusion. The device installed and which accomplishes this purpose consists of a 16-strap key switchboard in the dispatcher's office, connecting with No. 16 weather-proof wire to eight-drop annunciators fastened to the semaphore racks on the Fifth Avenue and Lexington Avenue platforms.

The Fulton Street platform, being the first platform on entering the station and at the entrance, was not equipped with this device, because the passengers could see as soon as the dispatcher on which side their trains would enter the station, and as these trains would unload and immediately load from this one stop, no waiting time was possible after a train came in.

The 16 keys on the switchboard are arranged in a double column of eight rows, a row to a line, so that each line has two keys, a key for each side of the platform for each line. A contact with a key on the right column will indicate that the train will load from that side of the platform and a contact with a key on the left column will indicate that a train will load from the left side. In order to make matters still more plain, the buttons on the right



**Train Announcing Device—Track and Platform Plan at the Brooklyn Bridge**

train would load from. Two of these platforms, particularly known as the "Fifth Avenue" and "Lexington Avenue" platforms, have for some considerable time been equipped with a train-announcing device, consisting of semaphore arms, which are lowered and raised by small hand levers, arranged in a frame so that when down they

column keys are red, standing for red line or north track, and on the left column white, standing for white line or south track, and the names of each line are plainly indicated between each column. The upper four rows on the switchboard connect with the Lexington Avenue platform, the lower four connect with the Fifth Avenue platform.

The annunciators on each platform are arranged similarly to the keys on the switchboard, and in the same rotation. There are eight drops in each, arranged in a double column of two rows each, a row to a line, with the name of the line painted on red and white paper and inserted in the left and right columns. The annunciators are also equipped with a bell, which notifies the semaphore man when a drop is down.

In this terminal the tracks are never spoken of as north and south, left and right, or designated by numbers, but as the "Red Line Track" and the "White Line Track," so that it is very easy in a case like this to denote the track over which a train runs by the colors red and white. This notation has come down from the days when the bridge cable trains were in service and were run over the bridge on gauntlet tracks, and in order that the flagman could distinguish which rail an approaching train was on a train would carry a white or red lamp at night, according to whether it was on the south or north track, and a white disk or none at all for the same purpose in daylight.

The operation of this device is very simple. For example, a Culver train enters the station on the south track; the operator in the dispatcher's office immediately makes a contact with the white key on the Culver row; this contact rings the bell and throws the white drop with "Culver" on it in the annunciator at the semaphore rack on the Fifth Avenue platform, indicating to the semaphore man that a Culver train will load from the south side of the platform. He immediately announces this to waiting passengers by raising the Culver arm on the south side of the semaphore rack. The Culver passengers, noticing this, have ample time to arrange themselves on that side of the platform, because this operation has all been done while the train is rolling into the station and must unload, run on to a tail switch, reverse ends and finally return to the loading platform, all of which takes time. This contrivance might be improved by having the switchboard connected directly with some kind of an illuminating sign, so that the one operation would serve to indicate to passengers what they wish to know, but the semaphore arms have been in place for some time, and an announcer is absolutely necessary on a platform from which a number of trains leave.

The entire cost of this contrivance, including labor, wire, switchboard and annunciators, was but \$88, but it is worth many times this amount in passenger comfort.

### ELECTRIC RAILWAYS IN ITALY

The electrical operation of the Valtellina line (64 miles) and of the Milan-Porto Ceresio line (44 miles) has proved so satisfactory that the electrification of the following lines is now in progress:

	Miles
Genoa-Pontedecimo-Busalla .....	12
Savona-San Giuseppe .....	12
Demodossola-Iselle .....	12
Gallarate-Arona .....	15
Milano-Lecco-Ponte San Pietro .....	56
Gallarate-Laveno .....	19
Barodnecchia-Modane .....	11
Naples-Salerno-Castellamare .....	35

Of these lines the Genoa-Pontedecimo is the most important, and it is expected that electric operation will begin in May, 1909. Energy will be furnished from two 5000-kw, three-phase, 13,000-volt, 15-cycle turbines. Current is transmitted to four transformer stations, where the potential is reduced to 3000 volts for the 1600-hp locomotives. The whole line is double track.

### EXHAUST STEAM TURBINE RESULTS IN PHILADELPHIA AND SCRANTON

In a paper on the low pressure steam turbine read Sept. 30 before the National Association of Cotton Manufacturers at Saratoga Springs, N. Y., C. B. Burleigh, of the General Electric Company's Boston office, referred at length to the experience of the Philadelphia Rapid Transit Company and the Scranton Street Railway with units of this type. The Philadelphia company in 1905 installed at its Thirteenth and Mt. Vernon Street power station an 800-kw Curtis low-pressure turbine. This station was equipped with four 1500-hp and one 2200-hp Wetherill Corliss engines, which had previously been operated non-condensing on account of the lack of cooling water. An Alberger condenser with 8000 sq. ft. of cooling surface was installed for use in connection with the low-pressure turbine. The rotary pumps for circulating the cooling water are direct connected to a 120-hp interpole motor, and the average vacuum obtained is 28 in. The 1500-hp engines are each direct connected to a generator which develops about 2000 amp at 575 volts. The turbine takes steam from a common exhaust main at a pressure of about 1 lb. above the atmosphere. Exhaust steam from one engine when delivering 2000 amp is sufficient to deliver an output from the turbine of 1300 amp at 575 volts, with no increase in back pressure upon the engine. As about 150 amp are required to operate the auxiliaries, the net gain from the turbine is from 1000 to 1200 amp, or about 66 2/3 per cent. As the gain from a condenser without the turbine would not exceed 25 per cent, the latter produces a net gain of 41 2/3 per cent.

The generator used with the turbine is a six-pole direct-current machine, making 1200 r.p.m., but the set is not fitted with a governor. With the turbine taking steam at atmospheric pressure, with 2-in. absolute back pressure in the condenser, the guaranteed water rate is 36 lb. per kw-hour at full load. If the engine-driven generators tend to take more than their share of the load, the engine governors admit an additional volume of steam to produce the necessary energy, and the engines in turn deliver more steam to the turbine, tending to speed it up, and thus raise its voltage to effect automatic regulation.

As the load conditions demanded a further increase in capacity, a second 800-kw unit of the low-pressure type was installed in 1906 under similar conditions, with condenser and cooling tower. All the auxiliaries required in the turbine installation are motor driven, with the exception of two dry-air pumps, one step-bearing pump and two discharge pumps, the exhaust from which is utilized for heating the feed water, and the power to operate them is about 14 per cent of the turbine output. The two turbines are run about 18 hours per day. The coal consumption for all purposes at this station was 4.48 lb. per kw-hour the first six months of 1905, before the turbines were installed. The coal consumption for all purposes after the turbines were placed in operation was, for the first six months of 1906, 4.08 lb. per kw-hour. This meant a saving of \$24,414 per year in fuel cost at \$3 per ton. It is figured that when further increase is needed additional low-pressure turbines will cut down the coal consumption of the engines to at least 3 lb. per kw-hour, and pay a good return upon the investment.

Looking at this plant from the first cost side, the original steam equipment cost about \$100 per kilowatt, and to have increased the capacity on the original lines would have re-

quired an investment proportional to the original outlay. The low-pressure turbines, however, were installed at an expense of approximately \$50 per kilowatt, and as the turbines were utilizing the energy of the steam previously unused, the fuel consumption was not increased a pound, 2300 kw being made available at no more expense as regards fuel and attendance than was previously necessary to deliver 1500 kw to the distributing mains. The accompanying curve sheet illustrates the power output and cost of this station from 1904 to 1907. During the year 1904 the engines were operated alone under normal conditions with the following results:

Average kilowatt-hour output per month.....	2,475,000
Average cost per kilowatt-hour.....	7.3 mills
Average cost of coal per kilowatt-hour.....	5.15 "
Average pounds of coal per kilowatt-hour.....	4.0

These conditions prevailed until January, 1905, when the first 800-kw low-pressure turbine was placed in operation, and the conditions for the next year were as follows:

Average	
Kilowatt-hours per month.....	2,500,000
Cost per kilowatt-hour.....	6.9 mills
Cost of coal per kilowatt-hour.....	4.97 "
Pounds of coal per kilowatt-hour.....	4.47

The addition of the low-pressure turbine, amounting to an increase of about 10 per cent in station capacity, delivering 10 per cent increased average power, used less coal to the extent of 105 short tons per month, or, in other words, an expenditure of \$40,000 enabled the purchaser to deliver 25,000 kw-hours more per month and save 105 tons of fuel. In January, 1906, the second low-pressure turbine was installed. The following were the conditions:

Average	
Kilowatt-hour output per month.....	2,957,500
Cost per kilowatt-hour.....	6.03 mills
Cost of coal per kilowatt-hour.....	4.5 "
Pounds of coal per kilowatt-hour.....	4.08

During the year from 1906-7 the turbine averaged to carry 16.8 per cent of the load.

Comparing the conditions during the year 1906, with the two turbines in operation, carrying but 16.8 per cent of the load, with the year 1904, before the turbines were installed, it was found that the station delivered an increased average amount of power to the extent of 19.5 per cent, or 482,500 kw-hours per month, and that the total cost of the station output for the year 1904, with the engines, was \$216,810, while the total cost for the year 1906, with engines and turbines delivering 5,790,000 kw-hours more than in 1904, was \$214,005. It thus cost \$2,805 less to deliver 19.5 per cent more energy, incident to the low-pressure installation.

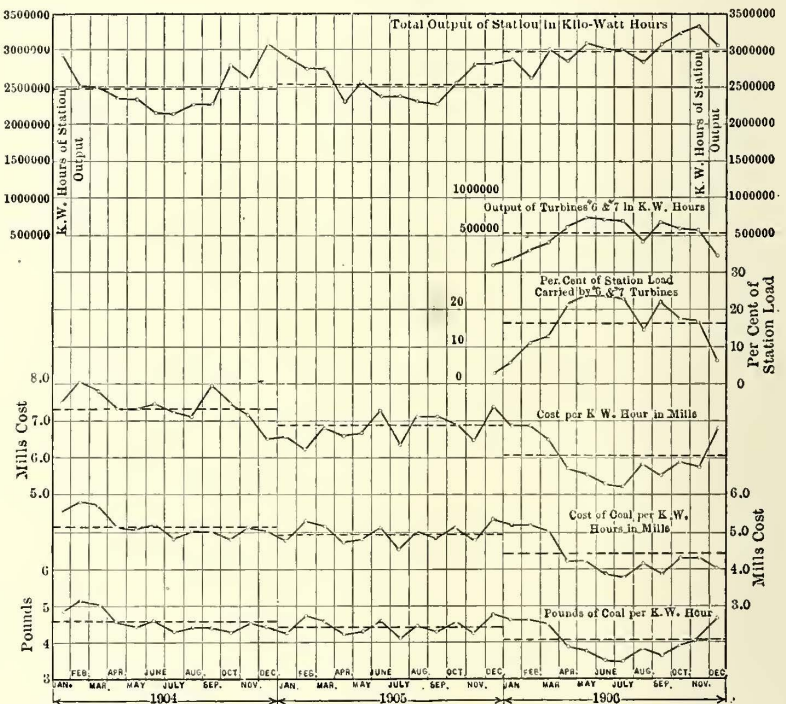
The Scranton Street Railway was equipped with four simple non-condensing Corliss engines, as follows:

	Rated hp	Kw
No. 1. Allis, 42 x 54 in., 97 r.p.m.....	1400	1000
No. 2. Dickson, 26 x 48 in., 80 r.p.m....	400	300
No. 3. Cooper, 26 x 48 in., 80 r.p.m.....	400	300
No. 4. Cooper, 30 x 38 in., 97 r.p.m.....	750	500
	2950	2100

The engines were operated at an initial pressure of 115 lb. Nos. 1 and 4 were direct connected, and the others were belted to individual generators of the capacity named. The average output of this plant is 1500 kw, while the maximum requirements of short duration taxed the entire plant

to its utmost. The exhaust of these four engines led down into a common tee, from the top side of which emerges a 30-in. free outlet to the atmosphere.

Early in 1906 a 500-kw Curtis low-pressure turbine was installed, taking steam through a 14-in. pipe connected to the 30-in. outlet, and exhausting through a condenser supplied with cooling water from the Lackawanna River, a distance of 450 ft., with a lift of 54 ft. to the condenser head, at mean height of the river. The turbine, therefore, works between atmospheric pressure and 28-in. vacuum at a water rate of about 38 lb. per kw-hour, or less than 20,000 lb. of steam per hour at its full rated capacity, while the engines, aggregating about 3000 hp, will at 30 lb. per hp exhaust, when working at their rated capacity, 90,000 lb. in the same time. There is, therefore, an opportunity here for the installation of at least two or three similar low-pressure units as soon as the load conditions warrant. The method of using the turbine output is similar to that practised in Philadelphia.



Power Output and Cost, Thirteenth and Mt. Vernon Power Station, Philadelphia Rapid Transit Company

Another installation of a low-pressure turbine is one of 800 kw in a plant in East St. Louis. It is equipped with a 500-volt d.c. generator, which is used in multiple with the engines from which the turbine receives its steam. The equipment is utilized for operating a railroad. There is also installed in this station a 1000-kw low-pressure turbine equipped with an a.c. generator taking steam from the same exhaust header and delivering its output for an entirely different purpose—that is, the operation of lights and stationary power throughout the district.

It is stated that the Kreihin Electric Company, Tokyo, Japan, has practically succeeded in obtaining from London capitalists a loan of 2,000,000 yen (\$996,000) wherewith to build a line from the Aoyama terminus of the Tokyo Railway to Shingawa. Official permission was obtained some time ago, and the only question that remained was that of finance. The loan is to carry 6 per cent interest and the company will receive 91 yen (\$86.27) per bond. It is said this company will double its Omori Shingawa line.

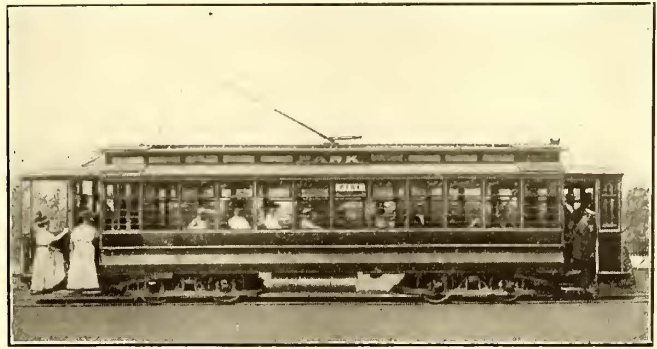


**PAY-AS-YOU-ENTER OPERATION IN ST. LOUIS**

As announced in a recent issue, the St. Louis Railways Company put in operation a number of pay-as-you-enter cars on its Olive Street line, which embraces the Delmar Street, McPherson Street and Maryland Street routes. The first cars went in service on the morning of Sunday, Sept. 20, that day being selected because of its light traffic on most of the routes, but no trouble was experienced in handling the baseball crowds in the afternoon. The company had prepared for the innovation by publishing notices in the daily papers and distributing circulars containing instructions what to do. The public also knew that cars of a similar type were being successfully used in New York and Chicago, as well as in other cities, and seemed eager to demonstrate that they were equally capable of using the cars. Subsequent reports from St. Louis indicate that the cars are operating satisfactorily. The company has passed an order that newsboys shall not board the cars to sell papers as is their custom with the other cars in St. Louis.

The St. Louis pay-as-you-enter car differs somewhat from those used elsewhere, as a bulkhead is employed on the rear platform instead of the usual railing. An account

ballast which has been previously compacted by a steam roller. The broken stone is then brought up flush with the top of the ties and is also tamped around the end of the ties. The top surface of the ties and ballast is level with the



Side View of New St. Louis Car

parking between the roadways and the rails are entirely exposed, which assists materially in lining up the track and maintaining the joints. The stone ballast is easily kept clean and free from weeds and presents a neat appearance in keeping with the parking. The right of way in the center of the roadway for double track is 25 ft. wide, and the tracks are spaced 9 ft. 8½ in. center to center. The company believes that the construction shown constitutes a great advance over that previously used in parked streets, or reservations, as they are termed in Boston. In the past considerable trouble had been experienced in maintaining the alignment and surface of these tracks, particularly during the spring, because the loam which covered the space between the rails would work down into the gravel ballast around the ties and soften it, thus permitting the ties to move sideways as well as, to a slight extent, vertically. The company believes that the use of the stone ballast, arranged as shown in the diagram, will do away with these difficulties.

It will be noted from the drawing that the grade of the track is 7½ in. above the grade of the macadam roadway. A gutter is formed along the edge of the roadway adjoining the parking right of way, exactly similar to the gutter on the outside of the roadway, so that the street pavement drains both ways from the center. This gutter is not shown in the illustration, but is made of blocks set against the curb and resting on a 4-in. gravel bed.

Span wire construction is used throughout by the Boston Elevated in this work, the poles being set in the narrow strip of sod separating the gravel sidewalk from the roadway gutter. The span of the wires supporting the trolley

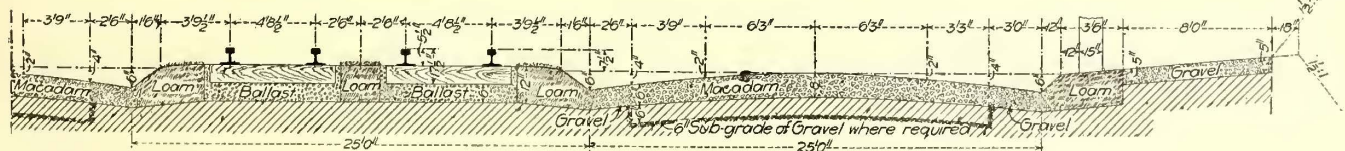


Rear and Front Platforms of Pay-As-You-Enter Cars St. Louis, Showing Bulkheads on Platform

of the car was published in the ELECTRIC RAILWAY JOURNAL of Aug. 22. They were built in the shops of the company on Park Avenue.

**TRACK CONSTRUCTION IN RESERVATIONS—BOSTON**

In the chapter on track construction in the first section of this issue a number of types of track construction used by the Boston Elevated Railway are illustrated and briefly described. This company has recently designed a new



Section of Track on Park Reservations in Boston

form of construction for parked streets which has received the approval of the State Highway Commission. In this construction 85-lb. A.S.C.E. rails 5 3/16 in. high are used. The ties are 7 ft. long and are laid on 6 in. of broken stone

wires is 79 ft. for a roadway with a total width of 100 ft. With this construction the roadways on each side of the tracks are connected with cross driveways at frequent intervals. These driveways are paved with brick.

## COMMUNICATIONS

### CAR WEIGHTS AND SEATING CAPACITY

THE WOEBER CARRIAGE COMPANY.  
DENVER, COLO., Sept. 28, 1908.

To the Editors:

In connection with the articles contained in your issues of Aug. 1 and Sept. 19 pertaining to weights of electric cars, it may be that some facts regarding the cars used by the Denver City Tramway will interest you. These cars, forty in number, have been in service for the past year, and saving some alterations on the trucks are giving good satisfaction.

The cars seat 48 passengers and weigh approximately 30,000 lb., or about 625 lb. per seat. The same company operates some 50 motor cars of like seating capacity weighing, with a four-motor equipment, approximately 42,000 lb., each of these cars hauling one double truck trail car seating 48 passengers and weighing 13,000 lb., the combined weight being 55,000 lb. and the combined weight per seat approximately 573 lb.

THE WOEBER CARRIAGE COMPANY.

[Further particulars and diagrams of these cars will be found in the ELECTRIC RAILWAY REVIEW for April 6 and May 4, 1907.—Eds.]

### CAR WEIGHTS AND SEATING CAPACITY

SOUTHERN PACIFIC COMPANY  
SAN FRANCISCO, Cal., Sept. 24, 1908.

To the Editors:

I have noticed with great interest the article in your issue of Sept. 19 headed "Data Concerning Electric Car Weights and Seating Capacity," but it appears that the table and tabulation are somewhat misleading owing to the fact that the seating capacity of the trailers does not appear to have been included when plotting the weight per passenger seat of the motor cars. I think this should be done in the case of trains; also that the seating arrangement must not be lost sight of, as naturally the spacing of seat centers for a given length-car has a direct bearing on the weight per passenger-seat.

I recently made up a table showing the weight per passenger-seat for eight representative electric roads in this

## CENTRAL ELECTRIC INTERCHANGEABLE MILEAGE TICKET

COLUMBUS, OHIO, Sept. 28, 1908.

To the Editors:

Every member of the United Commercial Travelers of America within the Ohio grand jurisdiction, comprising a membership of 7,500, is naturally interested in the perfection and betterment of the facilities for travel offered by the electric lines which traverse our State, as well as by other lines in the Central Electric Traffic Association territory. There is no way in which I could estimate the extent to which the commercial travelers will use the electric lines, but more salesmen will be attracted to these roads if they make their mileage tickets satisfactory both as to territory and lines parties thereto, and make satisfactory arrangements whereby baggage may be checked through from one line to another and the charge for excess baggage is made uniform.

As a member of the legislative and transportation committee of the Grand Council of Ohio, I can state that our organization is certainly interested in the new mileage ticket, and our only objection would be that it does not cover all of the lines in the State as well as those in the Central Electric Traffic Association territory outside of Ohio.

We are willing to assist this association in any manner possible, as this organization will mean more satisfactory arrangements for mileage, checking baggage and interchange among the various lines. We believe that what is to our interest will be and should be to the interest of the electric lines. The easier it is made for the commercial travelers to use the electric lines the more they will patronize these roads.

W. L. WHITACRE.

### A. I. E. E. CATALOG OF WHEELER GIFT

The bibliographical catalog of the books, pamphlets and periodicals of the celebrated Latimer-Clark collection presented by Dr. Schuyler Skaats Wheeler to the American Institute of Electrical Engineers has just been completed and is about to go to press. This critical catalog has been in preparation for the past six years under the direction of

TABLE SHOWING DIMENSIONS AND EQUIPMENT WEIGHT PER PASSENGER

Class of Service	Type of Car	Length Over All	Maximum Width	WEIGHT OF CAR EQUIPPED WITHOUT PASSENGER LOAD			NUMBER OF PASSENGERS			Weight, per Pass.-Seat
				Motors	Trailers	Total	Motors	Trailers	Total	
Interurban.....	All steel cars.....	62' 0"	9' 10 1/2"	106,000	89,000	(a) 407,000	64	64	(a) 256	1590
Interurban.....	All wooden cars.....	55' 5 3/8"	10' 1 1/4"	88,400			58		58	1524
Tunnel.....	All steel cars.....	48' 0"	8' 11"	73,500			44		44	1670
Interurban.....	Steel m. & Wooden t.	51' 2 1/2"	8' 10"	83,700	40,000	(b) 331,100	52	52	(b) 260	1273
Interurban.....	Steel m. & Wooden t.	51' 2 1/2"	8' 10"	77,178	51,300	(c) 402,612	52	52	(c) 364	1243
Interurban.....	All wooden cars.....	60' 0"	9' 0"	72,700	54,680	(d) 127,380	64	64	(d) 128	979
Interurban.....	All wooden cars.....	47' 1"	8' 7 1/2"	53,200	39,150	(b) 92,350	48	48	(b) 240	991
Interurban.....	All wooden cars.....	72' 10 3/8"	9' 9 1/2"	104,200	65,000	169,200	92	92	184	919
Interurban.....	All wooden cars.....	72' 10 3/8"	9' 9 1/2"	104,200	65,000	169,200	108	108	216	783
Interurban.....	All wooden cars.....	72' 10 3/8"	9' 9 1/2"	104,200	65,000	169,200	111	111	222	762

(a) Based on train of 3 motor cars and 1 trailer; (b) based on train of 3 motor cars and 2 trailers; (c) based on train of 4 motor cars and 3 trailers; (d) based on train of 1 motor car and 1 trailer.

NOTE.—The above weights per passenger do not include passenger load. Motors and trailers are considered in trains as they are actually operated in service.

country, the weight per seat being based on the train make-up of the equipments as operated. This table is subjoined.

You will notice that the last three items show a car of the same length and the same weight, but owing to a rearrangement of the seats a very great saving is shown under the heading of "Weight Per Passenger-Seat."

HAROLD W. CLAPP.

W. D. Weaver with the collaboration of Brother Potamian, of Manhattan College, and a number of other authorities here and abroad. The expense of this unique work has been defrayed by Andrew Carnegie. As soon as the book comes from the press it will be distributed to the members of the institute, who, according to the deed of gift of the library, are entitled to the catalog.

## RESULTS OF OPERATION OF NEW YORK CITY RAILWAY DURING RECEIVERSHIP

The receivers of the Metropolitan Street Railway, of New York, Adrian H. Joline and Douglas Robinson, have filed with the United States Circuit Court, New York, a statement regarding the operations of the New York City Railway for the period beginning Sept. 24, 1907, and ending July 31, 1908, during which they were receivers for the New York City Railway. Since July 31 last Messrs. Joline and Robinson have been acting as receivers of the Metropolitan Street Railway only, a separate receiver having been appointed for the New York City Railway.

The statement says that when the receivers took charge of the property, they found that the condition of the operating plants, with the exception of the power houses, had been allowed to deteriorate to so great an extent that a collapse was imminent. The statement continues:

Aside from the deteriorated condition of the equipment, we were hampered by the fact that the normal operating facilities had been seriously curtailed by the destructive fire which destroyed the 146th Street car house, in which were the main overhauling and repair shops of the system. By that conflagration over 300 cars (many of which had just been overhauled) were consumed; and the burning of other properties of the company had so alarmed the insurance world that the underwriters were very reluctant to carry the risks, particularly in view of the undeniably serious fire hazard which existed in almost every one of the car houses of the system. We promptly contracted for the purchase of additional revenue cars and for the necessary snow-fighting equipment—such as snow sweepers and slot scrapers—without which we could not hope to keep the road open during the approaching winter season.

The fire which occurred in one of the car houses shortly after we assumed charge of the property destroyed about 80 cars which were operated on the Eighth Street and Fourteenth Street lines. These we were fortunately able to replace by using part of a trust fund belonging to the Central Crosstown Company, but we were still confronted with the fact that in two other fires which had occurred prior to the receivership more than 300 cars had been destroyed, and it was incumbent upon us promptly to replace them, at least in part, or to face the alternative of endeavoring to operate the lines with a crippled service—an additional embarrassment being occasioned by the fact that so many of the cars on hand were in a state which required immediate overhauling.

### PAY-AS-YOU-ENTER CARS

On the subject of the pay-as-you-enter cars the statement says:

Notwithstanding the fact that the so-called "pay-as-you-enter" car at that time had not been operated elsewhere in the country under traffic conditions resembling those existing here, we determined, after a careful and exhaustive investigation, to procure cars of this type. The result of the operation of the "pay-as-you-enter" cars on the Madison Avenue line during the past few months has indisputably demonstrated that they afford accommodations to the public far more comfortable and satisfactory than any other type of street-car equipment heretofore used in this city, and has justified our action in the purchase of the 155 cars of that character which are now in operation.

While we have been unremitting in our endeavors to make a thorough test of this equipment, so far as it relates to the public convenience and safety, we have not forgotten that it should be our aim to accomplish this purpose without involving so severe a financial strain upon the resources of the property under our control, either in initial outlay or subsequent maintenance, as to render impossible the continuance of the policy which we inaugurated; and although it early became apparent to us that the principle of the "pay-as-you-enter" car was undoubtedly the proper one, we have striven to overcome the obstacle of what at one time appeared to be prohibitive expense.

Exhaustive experiments and investigations extending over a long period have been carried on by engineers working under our direction with the object of producing a type of "pay-as-you-enter" car which should be a material improvement, both from the standpoint of the public and from that of the company, over the type now operated. In order to accomplish this result data bearing upon the problem of street-car operation were obtained from approximately 20 other cities.

Our engineers made most comprehensive experiments with the various types of cars now running on our lines with the object of securing additional specific information, such as the relation between the weights of car bodies and the seating capacity; average length of stop per passenger boarding and alighting; acceleration when the car is empty and when loaded; power consumption and a mass of other figures of similar character.

The outcome of this research has enabled us to fix upon a type of "pay-as-you-enter" car lighter in weight, with 30 per cent greater seating capacity, and so mounted on improved trucks that the overhang of the car when passing around curves has been materially reduced, as compared with the standard "pay-as-you-enter" car which was placed in service last spring. Consideration has been given not only to the accomplishment of the results above mentioned, but to the effect which the operation of such a car would have upon all the branches of the system, such as the shop, car house, power and track maintenance departments, in every case a distinct improvement being secured over the situation resulting from the operation of the present "pay-as-you-enter" cars, so far as can be foreseen.

The modified truck will make it possible to lower the step, an improvement which the public will undoubtedly recognize. A better adjustment of the plow-carrying device has been secured, which will materially reduce the number of cars disabled on the road because of the peculiarly delicate character of the mechanism at present used; the arrangement of the exit and entrance doors should still further reduce the possibility of accident in connection with the operation of the cars, and also very greatly shorten the time of the stop which will be necessary to enable a given number of passengers to board or alight. A new type of motor has been evolved, and the problem considerably simplified by the possibility of operating the car with two motors of powerful character instead of four motors as heretofore. Not only does this accomplish a reduction in the weight of the car as a whole, but it should also very greatly cut down the cost of maintaining the electrical equipment.

To summarize, the new car will be more commodious and comfortable for the public, will be susceptible of more rapid operation, will consume less current, will reduce wear and tear upon the track structure, will involve less initial outlay and will cost less to maintain than the present "pay-as-you-enter" car.

Orders have already been given for the construction of 125 of these new cars, and work thereon will be pushed with all possible speed so that they may be placed in service at the earliest date practicable.

We have succeeded in placing contracts for these cars at a saving of approximately \$220,000, as compared with what the figures would have been had the present type of the "pay-as-you-enter" car been duplicated, and there will also be a decrease in operating charges. These economies have not been secured at the expense of the quality of the equipment; the new cars will be superior to the present cars.

The statement says that the judgment of the receivers respecting the need of overhauling the rolling stock was confirmed by the engineers of the Public Service Commission, which issued orders directing the receivers to do precisely what they, of their own volition, had undertaken to do. Two hundred open cars were sent to the plant of a car builder in a neighboring State for overhauling. Green paint has been substituted for the yellow used heretofore. The statement continues:

We have been making experiments with a new type of motor to be used on the standard cars with the object of securing more efficient and economical operation, and have

extended such experiments to other parts of the complete car equipment. Much of this work is now under way and it is our conviction, from the data already obtained, that results highly satisfactory in character will ultimately be secured. In consequence of what has already been done, we have reduced the amount of dead or unproductive car mileage which would otherwise have been operated, and have been able to increase the service and carry on the operation of the lines with decreased maintenance charges.

#### ACCIDENTS

The statement gives percentages of decreases in the various classes of accidents in April, May, June and July of this year as compared with the corresponding period of last year. It says on this subject:

The very satisfactory result is due largely to the fact that the rolling stock during those months was in a condition far superior to its condition during the corresponding period of the year before, and partly to the improvement in the matter of discipline among our employees with a proportionately more careful method of operation of the cars through the streets.

The following table indicates the percentages of decrease of the various classes of accidents:

	Per cent
Personal accidents, decreased.....	9.4
Wagon collisions, decreased.....	19.1
Car collisions, decreased.....	46.1
Decrease of all accidents.....	13.8

The disbursements because of the occurrence of accidents incident to street-car operation in New York City constitute a heavy drain on the finances of the company, and a reduction in the number of accidents so occurring is of distinct pecuniary advantage.

#### TRACK STRUCTURE AND REPAIRS TO PAVEMENT

In discussing the conduit electric system and the cost of repairs to asphalt pavement the statement says:

The conduit electric system is necessarily extremely expensive in the matter of construction because of the fact that nicety of adjustment must be combined with great strength and power to resist heavy shock and hard wear, particularly in a city like New York. This is rendered peculiarly difficult because of the obstacles in the way of maintaining an intricate mechanism beneath the surface of the street where a large part of the system is inaccessible without tearing open the street, with resulting enormous financial outlay, inconvenience to pedestrians and vehicles and interference with the running of the cars. The making of necessary repairs had been deferred for so long that the effect of operating the system in its weakened condition was becoming distinctly apparent when the property came under our control. We have done much in the way of the rehabilitation of the track structure, and this work is being prosecuted vigorously in different parts of Manhattan Island at the present time, with the result that the cars are run with less noise and jar, materially adding to the comfort of the passengers, and of those residing or transacting business in the vicinity of the lines affected. The effect on the rolling stock as a result of this rehabilitation of the track structure is also noticeable.

As a general proposition it is incumbent upon the street-car companies to maintain the pavement within, between and for a space of 2 ft. outside of their tracks. It is the custom of the city to enter into a contract with the asphalt companies to lay asphalt pavement on certain thoroughfares under a maintenance guarantee for a specified number of years, and in the past, whenever in making repairs to the track structure, it has been necessary to disturb the pavement, the railway company has sent an order for renewal to the asphalt company under contract with the city for the maintenance of pavement on the thoroughfare in question to replace the pavement so disturbed. The asphalt companies have then rendered to the railway company bills for the work done without regard to whether or not the pavement on the whole street had just been laid under, say, a 10 years' maintenance guarantee, or whether the maintenance guarantee had only one year longer to run. In cases where the contract rate was not charged, a rate was often fixed by the asphalt companies entirely disproportion-

ate under the circumstances involved, and in many instances when the work was performed, the asphalt companies on one pretext or another, would insist on cutting out and relaying a very much larger area than appeared to be reasonably necessary. This situation obviously was disadvantageous and unjust to the railway company, and we have accordingly taken steps to avoid such injustice in the future.

Taking a specific case, we applied to the city authorities in connection with renewal of track on Broadway, between Canal and Forty-second Streets, for permission to give the order for asphalt replacement to any asphalt company selected by us. This right has been accorded to us by the city with the result that pavement replacement will be accomplished at an estimated saving of \$36,000.

The receivers have instituted a method of detailed systematic accounting by the assignment of given job numbers to the different classes of work undertaken by which they are able to determine the cost of accomplishing certain results and the relative benefits accruing therefrom. As a result of the mechanical statistics already compiled the receivers say they have been able to enter into contracts more advantageous to them in the purchase of supplies than they could otherwise have hoped to secure.

#### EARNINGS AND EXPENSES

The following statement of the results of operation from Sept. 25, 1907, to and including July 31, 1908, was made:

Cash receipts:		
New York City Railway:		
Sept. 24, 1907.....		\$607,291.33
Passengers .....	\$12,475,076.94	
Advertising .....	243,750.00	
Express .....	23,448.69	
Mail .....	1,957.47	
Rental of property.....	264,865.65	
Sale of old material.....	97,995.17	
Dividends on stocks.....	101,500.00	
Other companies, for power, use tracks and miscellaneous .....	551,132.34	
Receiver, Third Avenue Railroad, for labor and material furnished, for .....	59,070.95	
Receiver, Forty-second Street, Manhattanville & St. Nicholas Avenue Railway, for services, etc.....	21,454.26	
Receiver, Union Railway, for services, etc. ....	18,708.87	
Receiver, Dry Dock, East Broadway & Battery Railroad, for services, etc....	11,553.09	
Receivers, Metropolitan Street Railway:		
Reimbursement for expenditures on 146th Street car house.....	\$290,102.04	
Reimbursement for expenditures on Ninety-ninth Street and Lexington Avenue car house .....	217,024.31	
Reimbursement for cars..	74,849.46	581,975.81
Receivers' certificate account:		
Reimbursement for improvements and betterments, etc.....	640,743.77	
Receiver, Yonkers Railroad, for labor and material furnished, etc.....	224.78	
Central Crosstown Railroad:		
Special construction fund:		
Reimbursement for cars.....	1,961.00	
Miscellaneous sources.....	77,714.11	15,173,132.90
Total cash receipts .....		\$15,780,424.23
Cash disbursements:		
Pay rolls—Operating, administration and clerical, claim and law departments..	\$5,983,661.34	
Payments to State and city, account of taxes and water rates.....	800,847.04	
Material and supplies required for operation, etc. ....	3,020,933.76	
Rent of lines operated under leases and agreements .....	3,128,589.60	
Replacement of property destroyed by fires—car houses, cars, etc., in advance of receipt of insurance from underwriters .....	774,506.31	
Sprinkler equipment, etc., required to prevent cancellation of insurance....	127,004.30	
Completion of First Avenue line construction to put line in condition for electric operation .....	159,558.36	
Miscellaneous track work, including modification of track for operation of pay-as-you-enter cars.....	326,582.12	
Miscellaneous construction work, necessary to operation.....	326,704.18	
Horses purchased .....	108,875.00	
Insurance premiums, rent of offices and yards, settlements of claims for injuries and damages, expenses of litigation and receivership.....	942,168.87	
Cash paid A. H. Joline and Douglas Robinson as receivers Metropolitan Street Railway .....	80,993.35	
Total cash disbursements.....		\$15,780,424.23

STATEMENT OF RESULTS OF OPERATION SEPT. 25, 1907, TO  
JULY 31, 1908.

Gross earnings:		
Cash fares .....	\$12,702,670.42	
Ticket fares .....	28,437.46	
Mail .....	819.23	
Express .....	20,883.41	
Total .....		\$12,752,810.52
Operating expenses:		
Maintenance of way and structures.....	\$1,180,454.37	
Maintenance of equipment.....	2,243,311.08	
Operation of power plant.....	998,826.14	
Operation of cars.....	4,012,227.70	
Injuries and damages—expended.....	603,263.54	
Injuries and damages—deferred.....	693,187.78	
General .....	793,723.75	
Total .....		10,524,993.76
Net earnings .....		\$2,227,816.76
Other income:		
Advertising .....	\$199,004.17	
Rental of land and buildings.....	121,581.71	
Rental of tracks.....	12,225.79	
Rental of equipment.....	8,717.55	
Miscellaneous interest .....	225,637.36	
Other income .....	5,592.47	
Total .....		572,759.95
Gross income .....		\$2,800,575.81
Deductions from income:		
Taxes—other than special franchise.....	\$671,521.87	
Taxes—special franchise—estimated on basis of assessment for year ended Dec. 31, 1907 .....	663,844.54	
Rent of leased lines on which perma- nent default has not been made.....	2,156,644.34	
Interest on funded debts of companies whose roads are operated under agree- ment on which permanent default has not been made.....	83,249.99	
Interest on real estate mortgage.....	40,375.00	
Interest on floating debt.....	3,129.85	
Claims against companies in hand of re- ceivers .....	383,947.27	
Total .....		4,002,712.36
Net income—deficit, not including charges defaulted.....		\$1,202,137.05

The following notes accompanied the figures:

In addition to the charges for operation shown above, expenditures have been made, incident to the operation of the property, amounting to \$398,155. Including these in the operating expenses the deficit is increased to \$1,600,292.05.

During the period default has been made of rent of lines operated under leases and agreements to an amount of \$5,377,570.15.

During the period expenditures have been made (not included in the above statement) on account of change of motive power, additional power machinery, enlargement of car houses, installation of sprinkler systems in buildings, new cars, restoration of property destroyed or damaged by fire, etc., amounting to \$1,536,259.56. Part of this was paid from the proceeds of receivers' certificates and part from other sources.

The statement calls attention to the fact that additional substations have been installed, and electrification of the First Avenue line has been completed. The work of equipping the cars with vestibules has also been completed.

## FIRE HAZARD AND INSURANCE

In discussing the fire hazard and improvements needed to make it possible to secure insurance the statement says:

It is not an exaggeration to assert that in September, 1907, there was not a single modern car house in the property of which we are now in charge. The introduction of the electric current into buildings which were not constructed with the idea that such an element would become a part of their every-day operation, obviously increased the fire hazard to an alarming extent. The large open areas, the necessity for using several floors because of the high valuation of real estate on Manhattan Island, and the unavoidably slow process of removing cars from the buildings, all tended to the same result.

The best car house, that at 146th Street, was among the first to go. This was followed by the destruction a few months later of the Eighty-sixth Street and Madison Avenue building; next the structure at Fourteenth Street and Avenue B was partially destroyed, and then the large car house at Ninety-sixth Street and Second Avenue was practically consumed.

Although our brokers made strenuous efforts in the in-

surance markets of the world to cover our risks, the difficulties increased, culminating at the time of the Ninety-sixth Street fire, after which we were practically without any insurance whatsoever. There was but one reasonable course to pursue, namely, that of reducing the fire hazard to a minimum—so far as our resources would allow—and convincing the underwriters of our sincere and thorough co-operation and our realization of the danger which threatened us.

The work of installing sprinkler equipments and stand-pipe systems in the various car houses was pushed forward with all possible speed. Auxiliary fire apparatus—such as chemical engines, chemical fire extinguishers, fire pails, axes and new hose—was procured and distributed through the premises. The watchman service was thoroughly re-organized. The men were carefully trained in all duties, both under normal conditions and in emergencies, and they were closely supervised by trained experts. The matter of increasing the auxiliary fire-alarm boxes and redistributing them in the various properties was taken up, and in order that every possible safeguard might be availed of, a corps of guards was organized, the men being stationed at all of the entrances of buildings, both night and day, with positive instructions to prevent the entrance of any person who could not conclusively demonstrate his right to be on the premises. The necessity of cleanliness was impressed upon the car-house employees and other men in the service, the penalty of negligence being summary and instant discharge. Frequent inspections at irregular hours were instituted, fire brigades in all the properties were organized and drilled, printed instructions have been prepared in pamphlet form and given to the men, notices have been posted liberally throughout the properties prohibiting smoking and setting forth the procedure to be followed in case of fire, and signs have been put up showing where the nearest fire-alarm box is located, colored lights also being used to designate such locations.

The structural features of the buildings have not been overlooked. Provision has been made for the running of chemical engines between the cars in case of necessity; fire walls have been built, cutting down the area in which a fire once started may rage; fire doors automatically closing have been installed in great numbers; waste cans for the collection of oily waste, rubbish, etc., have been conveniently placed in the buildings; wire glass has been installed in exposed windows; steel lockers substituted for wooden ones; particular attention given to the wiring on cars and in the car houses; strict instructions enforced requiring the cutting off of all electric current not absolutely needed for lighting or the movement of cars, and every possible precaution made effective.

The result of the adoption of the above measures has been an increased interest and the creation of an esprit de corps among the men, the restoration of confidence on the part of the underwriters, the placing of insurance until at the present time the risks are fully covered, and a general betterment of conditions far beyond what was thought to be even possible six months ago. Not only has additional insurance been secured, but as conclusive proof of the efficacy of the measures adopted the rates of insurance have been reduced.

The new car houses planned will be of modern steel construction reinforced with concrete, with additional fire walls, so as to reduce the area subject to conflagration. Sprinkler systems will be installed and modern methods of car-house operation adopted.

## ORDERS OF THE PUBLIC SERVICE COMMISSION

Some of the orders from the Public Service Commission, the statement says, directed that certain things be done which the receivers had already undertaken to accomplish, and in some cases had actually performed. In other cases, the statement adds, the demands of the commission seemed to be unreasonable and unwarranted by the facts, particularly their direction that a certain fixed service under all conditions should be operated on the lines which were definitely specified by them. The statement continues:

The case of the Eighth Avenue line will serve as an

illustration of this class of orders. When the order was issued calling for a totally disproportionate service on this line we called attention to its arbitrary character, but nevertheless agreed to operate the line as nearly as practicable in accordance with the commission's order. An actual trial under these conditions substantiated the soundness of our position. The service on the line in question was so excessive as to cause newspaper comment, and resulted to the detriment of other lines where the cars could have been used to much greater public advantage. A hearing was held on May 6, 1908, in accordance with an order of the commission, and at that hearing the commission's own engineers testified to the effect that the service on the line was greater than necessary.

We were willing to make the experiment for the purpose of demonstrating to the commission the fallacy of its theory, although such a course involved the expenditure of some thousands of dollars. When, however, as was recently the case, the commission attempted to dictate the manner in which a number of the lines should be operated, involving expenditures running up into the millions and far beyond our resources, there was no alternative but to state the facts plainly. Had we attempted to carry out the commission's demands, which were not justified by public necessity and which were impracticable from a purely operating standpoint in the judgment of experts who have had wide experience in transportation matters for many years, there would have assuredly followed the speedy disruption of the system into a number of independently operated lines, involving the abolishing of the transfer privileges, the discontinuance of many of the through routes and a general chaos of surface transportation conditions. It cannot with justice be asserted that at such a price to the public at large and to the owners of this property it was incumbent upon us again to demonstrate to the commission the sophistry of its reasoning. In so far as it was possible for us to do so we have striven to comply with the desires of the commission, and we have particularly sought to avoid the raising of any issue as between the Federal and State authorities; but when the commission undertook to pursue a course which in effect amounted to confiscation, our duty as receivers of the Federal court, responsible for the property entrusted to our keeping, rendered it necessary for us to take such steps as in our judgment were proper to protect property rights.

#### RENTALS UPON WHICH DEFAULT HAS BEEN MADE

The statement calls attention to the reasons for defaults in securities of subsidiary companies as follows:

It has been our purpose to keep the property from disintegrating—in so far as was consistent with sound financial policy—but it became apparent that under the conditions existing, and particularly because of the interpretation placed by the State courts upon the transfer statute of New York, certain of the lines could not be operated as an integral part of the system without incurring a deficit. Speaking plainly, the transfer law, instead of accomplishing the result which its authors probably expected it would secure, has operated as a boomerang; and in consequence it has been necessary for us to make default on certain leases calling for rentals which we were unable to meet through the impairment of the revenues due to the constantly increasing imposition upon the transfer privilege. Under the law a reasonable restriction of the transfer privilege is impossible, and we were forced to elect not to accept and operate under those leases; which, of course, involved the practical abolition of transfers as between the lines still remaining in the system and those which were thus severed from it. How much farther this process of disintegration will continue we are at this writing unable to say, but up to the present time we have defaulted on the following fixed charges:

	Per Cent Interest.	
Metropolitan Street Railway:		
General and collateral trust mortgage.....\$12,500,000	5	\$625,000
Four per cent refunding mortgage..... 16,604,000	4	664,160
Dividend rental on capital stock..... 52,000,000	7	3,640,000
Third Avenue Railroad:		
First mortgage..... 5,000,000	5	250,000
First consolidated mortgage..... 37,560,000	4	1,502,400
Dividend rental on capital stock..... 15,995,800	6	959,748
Central Crosstown Railroad:		
Dividend rental on capital stock..... 600,000	15	90,000
Fulton Street Railroad:		
First Mortgage..... 500,000	4	20,000

Central Park, North & East River Railroad:		
Dividend rental on capital stock.....\$1,800,000	9	\$162,000
Twenty-eighth and Twenty-ninth Streets		
Crosstown Railroad:		
First mortgage..... 1,500,000	5	75,000
Totals.....		\$7,988,308

The statement says that the surrender of leases of other lines is now under consideration and that so far as practicable the receivers have endeavored to readjust the routes so as to minimize the resulting inconvenience to the traveling public in consequence of the abrogation of the leases. The segregation of the Third Avenue road would have been attended with more serious consequences to the traveling public, the statement says, had an agreement not been entered into with the receiver of the Third Avenue line whereby the two systems availed themselves of the arrangements for supplying power previously in existence.

#### ORGANIZATION

The statement mentions the following changes in organization:

A superintendent of rolling stock and shops has been appointed, to whom the master mechanic in charge of shops and the superintendent of equipment report directly.

The transportation department and the appointment department have been brought into closer touch by placing both under the jurisdiction of the assistant to the general manager.

The real estate department has been reorganized and placed under the supervision of a man of practical real estate experience.

The many phases of the problem of reducing the fire hazard in buildings have rendered it expedient that a fire protection engineer should be placed in charge of matters of this character, and an official with this title has been added to the staff of the engineer of that department.

The work of the accounting department has increased enormously during the past year, and a reorganization thereof has been effected and the work classified to advantage.

Questions in many cases most technical in character have been continually presented for solution in connection with the rehabilitation of track and rolling stock, the construction of new buildings, the purchase of new equipment and the reducing of the fire hazard in the properties. To the end that the desired results might be accomplished, both economic and consistent with the best engineering practice, we have retained an independent firm of consulting engineers, and also secured the engineering services of another firm whose specialty is the minimizing of the fire danger in properties used for railroad operation. These engineers have co-operated with our own engineering staff in a manner which has been highly gratifying and productive of most excellent results.

The legal staff of our organization has been materially reduced, and almost all of the general legal business is now and for some time has been transacted by the counsel to the receivers and his assistant.

#### TRIAL AND CLAIM DEPARTMENTS

The following resumé of the work of the trial and claim departments is presented:

On Sept. 30, 1907, the number of tort actions pending against the New York City Railway was 7016; of these there were finally disposed of on June 30, 1908, 3665; the number remaining on calendars on June 30, 1908, was 3351.

On July 31, 1908, there had been filed with the special masters claims against the New York City Railway, arising on tort (excluding transfer penalty claims), 3624. These claims were tried and disposed of before the special masters and in the several courts in which the actions were pending, as follows: Claims allowed, 2231; disallowed, 1128; pending on July 31, 1908, 265. The number of transfer penalty claims pending is 2864. The 2231 claims allowed were liquidated for \$1,086,120, an average of \$486. This was divided as follows:

1,589 actions for.....	\$950,947	Average, \$598
642 claims for.....	135,173	" 210
Add 1,128 disallowed.....		.....
Total, 3,359 disposed of.....	\$1,086,120	Average, \$323

Between Sept. 24, 1907, and July 31, 1908, inclusive, the number of tort actions commenced against the receivers of the New York City Railway was 1265; during this period there were finally disposed of 721, leaving pending on July 31 544. Of the 721 claims disposed of, 430 were settled for \$128,098.65, an average of \$298, as follows:

Municipal court .....	126	for \$ 10,436.35	Average, \$83
City and county courts.....	87	" 14,255.00	" 164
Supreme and circuit courts.....	217	" 103,407.00	" 476

There were 47 judgments paid, amounting to \$10,908. There were 2100 claims arising out of operation which were settled before suit was brought, for \$125,765; average, \$59.

**ATLANTIC CITY BULLETIN No. 4**

Secretary B. V. Swenson, of the American Street & Interurban Railway Association, has issued Bulletin No. 4 in relation to the conventions to be held next week at Atlantic City, N. J. An abstract of this bulletin follows:

**RAILROAD RATES**

The Trunk Line Association, Central Passenger Association, New England Passenger Association, Eastern Canadian Passenger Association and the South Eastern Passenger Association have granted a rate of a fare and three-fifths on the certificate plan for all points within their territories. The Western Passenger Association grants special one-way rates to its Eastern terminals at Chicago, Peoria and St. Louis. The Southwestern Passenger Bureau grants reduced one-way rates to St. Louis.

Instructions to Delegates Coming from Points in Territory Governed by the Trunk Line Association, Central Passenger Association, New England Passenger Association, Eastern Canadian Passenger Association and the South Eastern Passenger Association

Delegates coming from points in the territory governed by these passenger associations are granted reduced rates on the certificate plan, and the following rules must be observed:

*First.*—Each person desiring the excursion fare must purchase a first-class ticket (either limited or unlimited) to Atlantic City, for which he will pay the regular fare, and, upon request, the ticket agent will issue a printed certificate of purchase of the standard form.

*Second.*—Tickets at full fare for the going journey may be secured within three days (exclusive of Sunday) prior to and during the first three days of the convention. The advertised dates of the convention are from Oct. 12 to Oct. 16, consequently you can obtain your ticket not earlier than Oct. 8, nor later than Oct. 14. Be sure that, when purchasing your going ticket, you request a certificate. Do not make the mistake of asking for a receipt.

*Third.*—If through tickets cannot be procured at the starting point, tickets should be purchased to the nearest point where such through tickets can be obtained, and there purchased through to Atlantic City and a certificate from the ticket agent at the point where each purchase is made should be requested.

*Fourth.*—Tickets for the return journey will be sold by the ticket agent at Atlantic City at three-fifths the first-class limited fare, only to those holding certificates signed by the ticket agent at point where through ticket to place of meeting was purchased, countersigned by the secretary of our association, certifying that the holder has been in regular attendance at the meeting, and certified by the special agent of the lines of the railway association.

*Fifth.*—Tickets for return journey will be furnished only on certificates procured not sooner than Thursday, Oct. 8 (except that when meetings are held at distant points to which the authorized transit limit is more than three days, the authorized transit limit will govern), not later than Wednesday, Oct. 14, and will be available for continuous passage only, no stop-over privileges being allowed. Certificates will not be honored for return trip if presented later than Tuesday, Oct. 20. The special agent at time of validation will collect from the holder of each certificate a fee of 25 cents.

*Sixth.*—On your arrival at the convention present your

certificate to B. V. Swenson, at the association booth, located at the entrance to the convention pier. It will be ready for you within 24 hours after presentation.

*Seventh.*—No refund of fare can be expected because of failure of the parties to obtain certificates, or to have them properly validated by the special agent, who will be in attendance during the convention days only.

*Eighth.*—It will be absolutely necessary for each person to obtain a certificate from the agent where the ticket is purchased, and to have it validated at Atlantic City, otherwise the purchaser will be unable to obtain the excursion rate returning, and will be obliged to pay full tariff fare in both directions.

*Ninth.*—So as to prevent disappointment, it must be understood that the reduction on the return journey is not guaranteed, but is contingent on an attendance at the convention of not less than 100 persons holding regularly issued certificates, obtained from ticket agents at starting points, showing payment of regular full one-way first-class fare of not less than 75 cents on going journey.

Instructions to Delegates from the Territory Governed by the Western Passenger Association, the Southwestern Passenger Association, and from Pacific Coast Points

Delegates from the territories of the Western Passenger Association and the Southwestern Passenger Association should take advantage of the reduced one-way rates in effect to Chicago, Peoria and St. Louis. Delegates from Pacific Coast points should avail themselves of the daily nine months' excursion rates between such points and St. Louis and Chicago.

Upon arriving at these Eastern gateways, delegates should purchase round-trip tickets to Atlantic City, and should read carefully the instructions given to delegates from Central Passenger Association territory.

Trains from New York to Atlantic City—Central Railroad of New Jersey

To accommodate those attending the convention, the Central Railroad of New Jersey announces that it will arrange to provide special Pullman parlor cars on New York-Atlantic City trains, leaving New York on Oct. 12, 13 and 14, from foot of West Twenty-third Street, at 9:50 a.m. daily (12:50 p.m. Saturday), 3:20 p.m. (except Sunday), 2:20 p.m. (Sunday only), and from foot of Liberty Street at 10 a.m. daily, 1 p.m. (Saturday only), 3:40 p.m. (except Sunday) and 2:30 p.m. (Sunday only).

All of the above are through express trains running via Red Bank and Lakewood. If a special number advise of their intention to use any one train, a special train composed exclusively of Pullman parlor cars will be operated for their accommodation. The parlor-car fare between New York and Atlantic City is 75 cents in each direction. Passengers by this route have the privilege of stopping over at Lakewood, and also of returning via Philadelphia. Applications for reservations should be made to W. C. Hope, general passenger agent, Central Railroad of New Jersey, 143 Liberty Street, New York.

**Pennsylvania Railroad**

For the accommodation of members of the association and their friends who will attend the convention, the Pennsylvania Railroad takes pleasure in announcing the operation of special parlor cars to Atlantic City on its fast through express trains, leaving New York 9:55 a.m. and 2:55 p.m. weekdays, and 7:55 a.m. Sundays only, and if there is sufficient number to justify, special train service will be provided.

The first-class one-way rate, New York to Atlantic City, is \$2.25, and six months' excursion rate, \$5. Parlor-car seat rate, 75 cents in each direction. Tickets via Pennsylvania Railroad will be available for stop off at Philadelphia within limit, at pleasure of the holder. Frequent and fast express service is maintained via Pennsylvania Railroad between Philadelphia and Atlantic City in both directions. For full information and parlor-car reservation, application should be made to Colin Studds, Eastern passenger agent, 263 Fifth Avenue, New York.

**HOTEL MATTERS**

We desire to impress upon you once more the advisability of securing hotel accommodations immediately if you

have not already done so. Select your hotel and address the manager, stating the number of rooms desired, whether with or without bath, number of people who will probably occupy rooms and whether or not any ladies will be in the party. Fifty hotels (with their rates) were listed in Bulletin No. 2. All of these hotels are within a short distance of Young's new Million-dollar Pier, where the convention meetings and the exhibition will be held. We will be pleased to advise you more fully concerning this subject upon request. There will be no advance in the regular hotel rates during the convention week.

Remember that each association has its own headquarters hotel. It is the desire of the officers of these various associations that, in so far as it may be practicable, delegates secure accommodations at the headquarters' hotels of their respective associations. The American and Manufacturers' associations have their headquarters at the Marlborough-Blenheim, while the Accountants' will be at the Chalfonte, the Engineers' at the Dennis, and the Traymore will be the headquarters of both the Claim Agents' Association and the Transportation & Traffic Association.

#### REGISTRATION AND INFORMATION BUREAUS

**Association Booth.**—All the delegates and guests of the American, Accountants', Engineering, Claim Agents' and Transportation & Traffic associations will register and receive badges at the Association Booth, which will be located at the boardwalk entrance to Young's new Million-dollar Pier. This booth will be kept open from 9:30 a.m. to 5:30 p.m. during all days of the convention. It will be the general headquarters for the associations and will serve as an information bureau concerning association matters.

**Manufacturers' Booth.**—The Manufacturers' association will also have a booth at the same place, which will take care of similar matters relating to the exhibitors and the members of the Manufacturers' association.

**In-and-Out Booth.**—Atlantic City has so many hotels and attractions that the members and delegates attending the convention find it very difficult to locate one another. This can be overcome if members will keep the in-and-out booth advised of their movements. This booth provides a registration of the movements of members during the convention. Uniformed call boys will be in attendance to assist in locating any one desired. An indexed card system will be kept up to date constantly. Each person registering will be given a card to fill out upon which he will indicate where he will be until a specified time. There will be two kinds of registration cards, white cards indicating to the clerks of the in-and-out booth that the information thereon can be given to any one inquiring, red cards indicating to the clerk that the information on the card is confidential and is to be imparted only to the names indicated in lower corner of card. The clerk will identify these people by their badge number.

#### EXHIBIT OF MANUFACTURERS' ASSOCIATION

The American Street & Interurban Railway Manufacturers' Association is making great preparations for a most magnificent exhibit which will cover the entire area of Young's new Million-dollar Pier. The exhibit will be larger and more comprehensive than ever before. More than 200 different companies have already been assigned exhibit space, and the total amount of floor space will be considerably greater than that used at the 1907 convention exhibit on the steel pier at Atlantic City.

#### GENERAL PROGRAM OF THE AMERICAN ASSOCIATION

Tuesday, Oct. 13—2 p.m. to 5 p.m. (Executive session)

Convention called to order.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Announcements.

New business.

Reports of committees.

(a) Membership.

(b) Subjects.

(c) Federal and State control.

Wednesday, Oct. 14—2 p.m. to 5 p.m. (Executive session)

Appointment of nominating committee.

Reports of committees.

(a) Education.

(b) Compensation for carrying mail.

(c) Interstate Commerce Commission classification.

(d) Committee to confer with Interstate Commerce Commission on depreciation.

Thursday, Oct. 15—2 p.m. to 5 p.m. (Executive session)

Reports of committees.

(a) Insurance.

(b) Welfare of employees.

(c) Municipal ownership and public relations.

(d) Nominations.

Election of officers.

Installation of officers.

Resolutions.

Unfinished business.

Adjournment.

#### ENTERTAINMENT

The Manufacturers' association has practically completed its plans for entertainment during the convention and the detailed arrangements will appear in the official program. On Monday evening occurs the annual carnival of the Atlantic City Business League. On Tuesday evening the annual reception will be held at the Marlborough-Blenheim Hotel. The amateur vaudeville performance will be given at the Savoy Theater on Wednesday evening; two theaters have been engaged for Thursday evening and a musical entertainment occurs at the Marlborough-Blenheim on Friday evening. In addition, there will be several afternoon entertainments for the ladies during the convention week.

#### SUB-COMMITTEES ON EXHIBITS

The exhibit committee of the American Street & Interurban Railway Manufacturers' Association announces the appointment of special committees on space, cars, decorations, whereabouts register, shipments, power and lighting. These committees are as follows:

**Committee on Space.**—L. R. Ashhurst, Jr., and A. L. Price. This committee will take up any matters in reference to disputes regarding space, charges for space, arrangements or changes in details of space and assist the director of exhibits in these particulars as far as possible.

**Committee on Cars.**—Dwight Dean and Charles S. Ayres. This committee will have charge of the arrangement of the temporary car trestle, the unloading and placing of cars for exhibit on the trestle and their removal after convention.

**Committee on Decorations.**—E. H. Baker and Charles J. Mayer. To this committee has been assigned the duty of carrying out the plans made by the director of exhibits for the general decorations of the pier before and during the convention.

**Committee on Whereabouts Register, Check Room and Ladies' Rest Room.**—W. D. Brewster, Thomas Farmer, Jr., and John C. Jay. This committee will have direct charge of the clerks in the in-and-out booth, the call boys employed in connection with the whereabouts register and check room and the maids in the lobby and ladies' rest room, to see that their work is carried out properly.

**Committee on Shipments.**—F. J. Drake and Daniel W. Smith. This committee with the director of exhibits will have general charge of any complaints regarding shipments, will assist in tracing any lost articles and will see that contractors carry out their agreement with the association, particularly regarding charges.

**Committee on Power.**—F. H. Gale and C. N. Leet. To this committee has been assigned the duty of seeing that the contractor arranges for all necessary feeders and terminals as agreed and that every exhibitor has ample power to meet his requirements.

**Committee on Lighting.**—Benjamin Hayllar. Mr. Hayllar, in connection with the director of exhibits, will have charge of the general electric lighting on the pier, will see that each building is suitably lighted for exhibit display during the evening and will also take up the question of general lighting in connection with such special lighting as each exhibitor will provide by means of electric signs and special lamps.



**MEETING OF THE CENTRAL ELECTRIC ACCOUNTING CONFERENCE AND THE TRAFFIC ASSOCIATION**

The Central Electric Accounting Conference and the standing auditing committee of the Central Electric Railway Association met in Indianapolis, Ind., on Oct. 3, and submitted the following report, drawn by a committee to the Central Electric Traffic Association:

The Standing Auditing Committee begs to submit the following report on uniform blanks and methods of accounting for the Central Electric Traffic Association interchangeable mileage coupons.

All lines will report interchangeable mileage coupons lifted on blank in accordance with sample attached, designated Form C. E. T. A. The value of the mileage lifted is to be included in the report of interline ticket sales for the month in which lifted. The report and mileage enclosed are to be forwarded not later than the fifteenth day of the calendar month following the month in which lifted.

If any line should not have interline ticket sales to report the value of the mileage should be shown on interline ticket report blank and forwarded in the usual manner.

The question of listing coupons lifted will be optional with the individual companies, but all companies will be required to use blank Form C. E. T. A. whether a list is enclosed or not.

We recommend that settlement be made on balances, the creditor line to make draft on the debtor line for balance due each month; this method of settlement to be optional with the lines interested and those that object to settlement by draft to arrange such other method of settlement as may be satisfactory.

The report is signed by M. W. Glover, auditor Ohio Electric Railway; Walter Shroyer, auditor Indiana Union Traction Company, and A. F. Elkins, auditor Columbus, Delaware & Marion Railway.

The blank form recommended for reporting interchangeable mileage ticket coupons is as follows:

Form C. E. T. A. ....

**THE NORTH & SOUTH RAILWAY COMPANY.**  
Statement of Interchangeable Mileage Coupons,  
The Central Electric Traffic Association.

Mr. .... Auditor.  
..... Dr.  
For C. E. T. A. Interchangeable Mileage Coupons, .... (No. ....)  
accepted during the month of ....., 190..  
and enclosed herewith: .... miles at 1¾ cents per mile \$.....  
(added)  
We have ( ) on account of error on our statement  
(deducted)  
of....., 190 , per letter of ..... \$.....  
Balance due.....\$.....

This amount to be included in report of Interline ticket sales to the North & South Railway Company for month of .....  
Please make no alterations on this report. If any discrepancies are found, advise by letter and correction will be made in subsequent statement.

..... Auditor.

The report was adopted and all lines using the new interchangeable mileage ticket will be required to follow the plan proposed. The method of settlement and blanks were discussed by the accounting conference and approved. The Indiana Union Traction Company, the Terre Haute, Indianapolis & Eastern Traction Company and the Ohio Electric Railway agreed to settle on balances by draft, but the other lines were not prepared to enter into an agreement at this time and the chairman, M. W. Glover, was directed to submit the matter to each line and request an expression of opinion as to the method of settlement desired; the result to be reported to the next meeting of the conference, and all companies to be advised of the plan adopted by each line. It was thought that when the advantages of settlement by draft on balances were presented, most lines would agree to this method in view of the fact that monthly settlements are compulsory under the terms of the mileage agreement.

The question of uniform blanks for freight and ticket accounting was suggested and it was decided to consider this subject at the next meeting. The committee on uniform blanks was instructed to be prepared to submit a report at the next meeting.

It was decided to hold the next meeting of the conference in Lima, Ohio, on Nov. 18, the day before the next regular meeting of the Central Electric Railway Association.

After discussing informally several other matters, the conference adjourned, as most of the members desired to attend the meeting of the Central Electric Traffic Association.

**MEETING OF THE TRAFFIC ASSOCIATION**

A meeting of the Central Electric Traffic Association was held in Indianapolis on Oct. 3. The meeting was called to order by A. L. Neereamer, chairman of the association, who said it was very gratifying to know that representatives from 25 roads were present, indicating the interest manifested in the work of the organization.

Mr. Neereamer stated that the object of the meeting was to discuss tariffs and concurrences. He said the work in the office of the chairman was too heavy for one man, and he was authorized to employ a rate clerk and stenographer. Mr. Neereamer was authorized to subscribe for various tariffs and rate circulars issued by railroads and tariff associations.

A resolution was then adopted providing that Mr. Neereamer act as agent for the filing of tariffs for the members of the association, as may be authorized and published from time to time, and that the members immediately furnish him with the necessary powers of attorney. The association then adopted a form for a basing and selling rate sheet to be formulated in accordance with a sample sheet which was presented.

The question of the rate to be charged on excess baggage was discussed, and a resolution was adopted providing for a rate of 16 per cent of the one-way first-class passenger rate per 100 lb., with a minimum of 25 cents. The question of through checking of baggage to interline points was considered, and as a result it was shown that the problem was complicated by a number of difficulties. Thereupon the committee in charge of this branch of the service was instructed to continue its investigation and consideration of a plan, with authority to call to its assistance the members of the standard auditing committee.

The advisability and necessity for a uniform bill of lading was discussed. It was asserted that the proposed uniform bill of lading would be in violation of the Indiana transportation laws, but not the Ohio statutes. The question, however, presented such uncertainties as to make it appear advisable to leave the subject in the hands of a committee for future consideration and adoption.

The auditors then presented their report, prepared at a meeting earlier in the day, as reported elsewhere.

The territory to be covered by the use of the mileage ticket now ready to be put in use was discussed informally. It was agreed to accept connecting steam roads and also steamship lines on the lakes and the rivers accessible to roads that have become members of the association, as it was thought that if more lines became parties to the ticket it was made more valuable to the traveling public. In justice to the steamer lines, because of the close of navigation for five or six months each year, the basis of the expense of membership for them will be less than for the electric lines.

The question of making party rates was considered, and many suggestions were made, but definite action was deferred until a future meeting.

Mr. Neereamer stated that the work of placing the association on its feet involved a great amount of work and a persistency that few would have anticipated. But now that his labors had been rewarded, the assured success of the association was gratifying to him. He stated that all the principal suburban lines of Indiana and Ohio were members, and that roads operating only about 200 miles of track in Indiana and about 1300 miles in Ohio are still outside the association. The mileage represented in the association is greater than the mileage outside.

Mr. Neereamer called the members' attention to the necessity of filing concurrences for freight traffic as well as for passenger traffic.

It was suggested that the association hold at least one meeting each month, and Indianapolis was considered the most desirable point for conferences. The next meeting, however, will be held at the Lima House, in Lima, Ohio, on Nov. 18, the day preceding the regular bi-monthly meeting of the Central Electric Railway Association.

### ◆◆◆ PUGET SOUND FLAT CAR LOCOMOTIVE

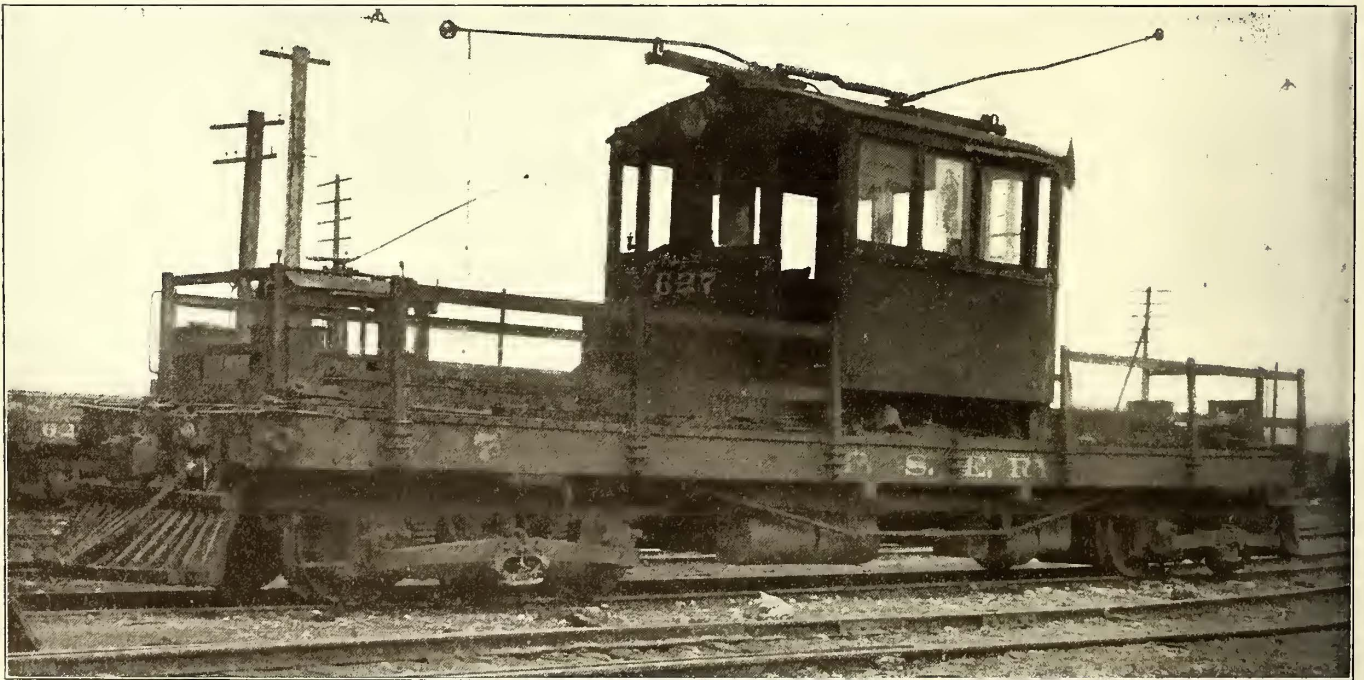
In the construction of its latest electric locomotive the Puget Sound Electric Railway has made a radical departure from the usual sloping cab type, in which most of the apparatus is mounted above the floor. While it was

and workmen, the cargo being disposed so that the motorman can look out of a side window and get a clear view of the train, the track and the signals ahead.

This style of construction makes it unnecessary to haul one or more flat cars for which there would be no room at the scene of a wreck or washout and which would also cause trouble in switching. Again, during the Tacoma racing season the floor of the locomotive is cleared and a wire-netted railing is strung around the sides and ends. Longitudinal seats are provided and at times the locomotive carries 50 to 60 passengers in addition to hauling five or six standard flat cars heavily loaded with passengers from the race tracks.

To secure additional weight for tractive effort, the center of the car is loaded with boxed T-rails spiked to the floor so that they will not be shifted by the jar of coupling. The cab is equipped at both ends with controllers and is electrically heated for the benefit of the men in cold or rainy weather. As the cab is quite spacious, it can also be used for passengers when desirable. The locomotive is arranged for both third-rail and overhead operation. It carries pilots, couplers, train-line hose, pneumatically operated sand boxes, cab headlights and other parts essential for complete operation.

In the earlier center cab locomotives built by this company the cab was not as wide as the car, so that in leaning out of the cab the motorman could not get a satisfactory view of the side of his train. The machine illustrated does not possess this defect and is quite as capacious for the



Center Cab Electric Locomotive, Built by the Puget Sound Electric Railway

recognized that such a design is advantageous in permitting easy access to the apparatus, it was of more importance to the company to have an equipment combining the functions of locomotive and car. As shown in the accompanying illustration of locomotive No. 627, the principal apparatus is carried beneath the floor and is controlled from the motorman's cab in the center of the car. The cab floor is so supported that the greater part of it is above the car floor, leaving a space 18 in. deep on each side for the loading of rails, poles or other objects not exceeding the 36-ft. length of the car. At the same time the space in front and behind the cab is available for ties, track tools

storage of long pieces. Both varieties of this type of locomotive were built under the direction of W. S. Dimmock, manager, who has found them very well suited for Tacoma operating conditions.

◆◆◆  
The Master Car Builders' Association has received an unconditional bequest of \$5,000 from the estate of the late Mrs. Luther G. Tillotson, whose husband for many years prior to his death, was a prominent railway supply dealer. The American Railway Master Mechanics' Association received the same amount under the terms of the will, which was filed for probate in New York on Sept. 29.

## PRIZES FOR ESSAYS ON CAR CONSTRUCTION

The J. G. Brill Company has offered three prizes to the senior students of the technical schools of the United States for the three best essays on the subject of "The Design of an Electric Railway Car for City Service." The company believes that this offer will stimulate interest among the graduating engineers of the technical schools of the country in proper car construction, which is undoubtedly of as great importance for city and interurban electric railway companies as any other department of the work. The theses are due at the office of the Brill Company on or before June 15, 1909. The announcement of the Brill Company in regard to these prizes follows:

To the senior students of the technical schools of the United States who will be graduated in 1909, The J. G. Brill Company, of Philadelphia, manufacturer of cars and trucks, offers Five Hundred Dollars (\$500) for theses on the subject

"Design of an Electric Railway Car for City Service"

The authors of the three theses which in the estimation of a jury shall be considered most meritorious of those submitted, shall receive respectively in order of merit of their work

1. The sum of Two Hundred Fifty Dollars (\$250)
2. The sum of One Hundred Fifty Dollars (\$150)
3. The sum of One Hundred Dollars (\$100)

The subject may be considered from any standpoint the student may elect or from all, i. e., from the standpoint of the construction of the car body, the standpoint of the truck, the standpoint of the electrical equipment and its arrangement, etc.

Each thesis will be judged:

1. On its technical merit
2. On the manner in which the subject is presented

A jury of three whose decision shall determine the winners of the respective prizes will be appointed to consider the relative merits of theses submitted. The jury will include an electric railway official of prominence who is thoroughly conversant with the features and requirements of electric railway car construction; a member of the editorial staff of one of the technical journals in the electric railway field; an expert in car construction.

All theses to be considered shall be typewritten or printed on standard size 8½-in. x 11-in. sheets. All accompanying tracings or blueprints shall be of corresponding size or of such shape as to be conveniently folded to that size.

A thesis to be eligible for any one of the prizes need not be prepared especially for this contest. It may be the same thesis which is submitted in connection with senior graduating work; but it shall be the work of a student during his senior year and shall conform to the requirements of the competition.

All theses to be considered must reach the office of The J. G. Brill Company on or before June 15, 1909; shall be sent either by mail or express, charges prepaid, flat (unrolled and not folded) and packed in such a manner as to insure their delivery in good condition. They shall be addressed to the Technical Department, The J. G. Brill Company, Philadelphia, Pa., and shall in addition bear on the outside wrapper the words "Car Design Thesis."

No thesis shall bear on the text pages or other parts submitted to the jury any mark which might inform any member of the jury as to the name and address of the contestant. But each thesis shall be accompanied by a sealed envelope containing the name and address of the contestant and the name of the college or university at which he is a student. These envelopes will be numbered consecutively in the order of the receipt of the theses, a corresponding number being attached to each thesis and the envelopes preserved for reference until after the jury has made its decision.

The announcement of awards will be made as soon as possible following the final date on which theses may be received. A copy of the announcement will be sent to the author of each thesis submitted.

A copy of each thesis after the completion of inspection

by the jury and the announcement of awards shall become the property of The J. G. Brill Company.

Additional copies of this circular or any further information which may be necessary regarding the conditions of the contest or manner of awards, may be had from

Technical Department,  
THE J. G. BRILL COMPANY,  
Philadelphia, Pa.

PHILADELPHIA, Sept. 28, 1908.

## PAPER ON SINGLE-PHASE SYSTEM

A paper entitled "Some Notes On the Single-Phase Railway System" was presented by Clarence Renshaw at the convention of the Colorado Electric Light, Power & Railway Association, at Glenwood Springs, Col., Sept. 16 to 19. Mr. Renshaw drew a comparison between the requirements of direct and alternating current roads and referred to the Indianapolis & Logansport direct-current line of the Indiana Union Traction Company, which is approximately 80 miles long and is fed by five substations 17 miles to 19 miles apart. The trolley wire is No. 000 and in addition there is a 600,000-circ. mil feeder between the two substations nearest Logansport and a 550,000-circ. mil feeder the remainder of the distance. If this line were operated at 6600 volts single-phase, the trolley wire only would be required and it could be fed for the entire distance from two transformer stations, each containing two 500-kw, two-phase transformers. The York-Hanover single-phase line, which is 19 miles in length and operates 45-ton cars with four 75-hp motors, has a single No. 0000 trolley wire with no feeders. The Pittsburg & Butler Street Railway, 40 miles in length, with many grades and 40-ton cars, has a No. 000 trolley wire with no feeders. The Spokane & Inland, with 72-ton locomotives and 300-ton trains, also has no feeders. The use of the single-phase system on this latter line effects a saving of energy in a novel way. The line, which is approximately 160 miles long, receives its energy in the form of 60-cycle three-phase current from the Washington Water Power Company, at Spokane. This current is transformed by the railway company at a frequency changing station into 25-cycle single-phase current for use on the line. As is the case with all water-power plants, the peak load is an extremely important item and the contract is so drawn up that a heavy peak used even for a very short time may have a large influence on the bill for the entire month. In consequence if the switchboard attendant at the frequency changing station sees a peak coming, he opens the circuit to the line for a few moments, as a matter of warning to the motormen who have been causing the heavy pulls, and then throws it on again. Mr. Renshaw asked his auditors to imagine a switchboard attendant trying to do this on a 160-mile direct-current line.

In comparing weights, Mr. Renshaw said that one of the most popular single-phase equipments is a quadruple equipment of 100-hp motors. The Westinghouse Company does not manufacture a direct-current motor of exactly this size, but it does manufacture a 90-hp motor, so that he would use the 90-hp direct-current motor for comparison with the 100-hp single-phase motor. Continuing, he said:

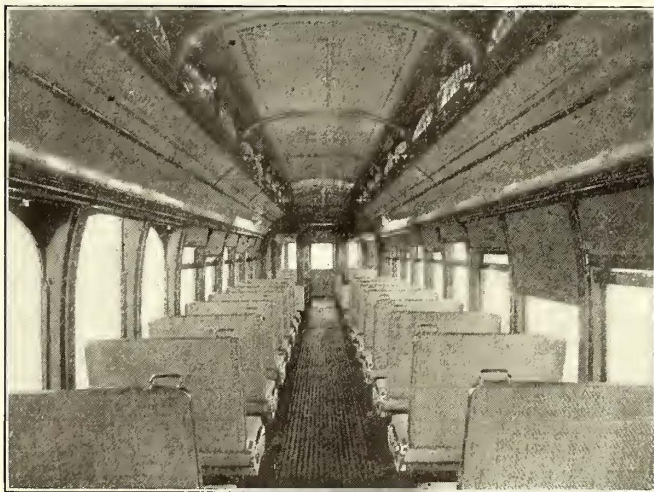
The weight of the 90-hp direct-current motor only, complete with gears and gear case, is 4300 lb. That of the 100-hp single-phase motor is 5300 lb. A quadruple equipment of these 90-hp direct-current motors with train control weighs 20,000 lb. A quadruple equipment of the 100-hp single-phase motors with train control for operation on alternating current only weighs 31,500 lb. or 34,500 lb. if arranged for operation on both alternating and direct current.

In operation, however, it is not the weight of the equip-

ment alone which must be considered, but the weight of the complete cars with their passenger loads. The car on which these equipments would ordinarily be mounted would weigh approximately 65,000 lb. complete with air brakes, to which the ordinary passenger load would add about 5000 lb. more. Such a car if equipped with quadruple 90-hp direct-current motors, therefore, would weigh 90,100 lb. The same car, if equipped with quadruple 100-hp single-phase motors, would weigh 101,500 lb. for operation on alternating current only, and 104,500 lb. for operation on both alternating and direct current. The total weight of the car, therefore, complete with average load, when equipped with 100-hp single-phase motors would be only 13 per cent more in the first case, or 15½ per cent more in the second case, than it would if equipped with 90-hp direct-current motors, in spite of the fact that the single-phase motors would have 11 per cent greater capacity than the direct-current motors.

### IMPROVEMENTS IN LEXINGTON, KY.

The Lexington & Interurban Railways Company, which is a consolidation of the Lexington Railway Company, the Central Kentucky Traction Company and the Blue Grass



Interior of Lexington & Interurban Railways Car

Traction Company, is one of the MacAfee chain of traction properties and has recently been making a number of improvements under the direction of John B. Crawford, general manager. The company now operates interurban lines to Frankfort, Georgetown and Paris, and has a fourth under construction to Nicholasville, a distance of 12 miles. Plans for a large power station have also been prepared and approved by the management. This station will be located at Valley View, about 4 miles east of Nicholasville and on the Kentucky River.

Construction will be commenced on this station about Jan. 1, 1909. Power from it will be transmitted to Lexington at 33,000 volts.

The company has also practically completed plans for a new car house, with concrete foundations and piers, wooden walls and composition roof. The car house is to be 200 ft. long by 100 ft. wide, and it is expected will be finished by Nov. 1. It is located at Loudon Avenue and Limestone Street, Lexington.

For its interurban lines the company has put in service the design of car illustrated in the accompanying engraving. The pattern is very similar to that used on the Inland Empire Railway of Seattle and was built by the J. G. Brill

Company. The car is 53 ft. 9⅞ in. over vestibules and 54 ft. 9⅞ in. over bumpers and is mounted on Brill 27 E-2 trucks with Standard Steel Company's 33-in. rolled steel wheels. The interior of the car is provided with three compartments—that for baggage, 10 ft. 7⅞ in. long; that for colored passengers, 10 ft. 8 in. long, and the white compartment, 27 ft. 6 in. long. The vestibule, at the rear end of the car, is 5 ft. ½ in. in length. The car is 8 ft. 8 in. wide over sills and sheathing.

The interior of the car is finished in cherry, with the Empire ceilings and arched top sashes, which can be raised into pockets in the space between the letter board and the head lines. The cars are upholstered in rattan.

### WARNING NOTICE PRINTED ON CHICAGO TRANSFER

The Chicago Railways Company has issued a new style of transfer intended to prevent the abuse of the transfer privilege. The transfer is illustrated herewith. It is ex-

## WARNING!

**It is unlawful to give away or to receive for use, or to sell, barter or exchange this transfer slip. Penalty from \$5.00 to \$100.00 for each offense. Section 1500 A, Revised Municipal Code of Chicago.**

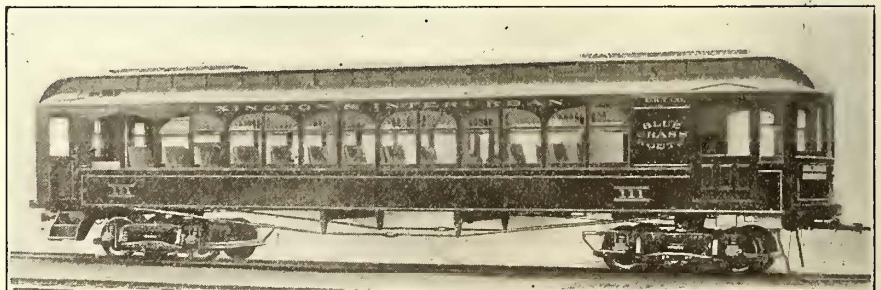
### CHICAGO RAILWAYS CO.

Warning Notice on Back of Chicago Transfer

pected by the company that misuse of transfers will be reduced materially if people understand that when transfers are given away it is possible for persons to sell or exchange the slips.

### SINGLE PHASE ON THE LONDON, BRIGHTON & SOUTH COAST

A pamphlet just published by the London, Brighton & South Coast Railway of its new Victoria station gives, among other information, some particulars of the single-phase equipment which that company is installing, and which will run into this station. The pamphlet says that the section to be electrically equipped from Victoria to London Bridge is 9 miles in length and includes 23 miles of single track. There will be seven trains in regular service and one spare train, each train to be made up of two motor cars, each equipped with four 125-hp motors,



Side View of Lexington & Interurban Railways Car

and one trail car. The running time between Victoria and London Bridge will be 25 minutes, including stops, instead of 36 minutes as at present in the steam trains. The total seating capacity of each train is 188. The type of car used is a modified form of side-entrance compartment car with continuous aisles.

The overhead equipment is of the catenary type. To comply with the provisional requirements of the Board

of Trade as regards voltage drop in the return circuit and with the requirements of the Admiralty in respect to interference with the apparatus at the Greenwich Observatory, a special system of duplicate feeders has been provided. Power will be taken from the Deptford station of the London Electric Supply Company.

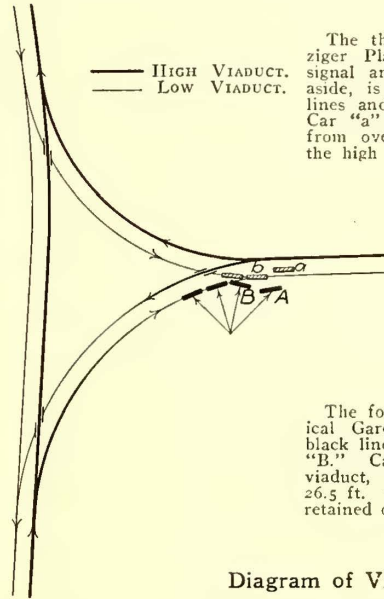
**ELEVATED CATASTROPHE IN BERLIN**

Between 1:40 and 2 p. m. Saturday, Sept. 26, a very serious accident occurred on the Berlin elevated railway at a place where two separate lines on a low viaduct climb

low Street station in the same direction, running to Möcker Bridge. The second train had a clear signal and was running at full speed into the tracks at the Y in front of the company's power house at Market Street. At this place tracks from the south and the west turn into the tracks running east on the higher level. The train coming from Leipziger Platz was forbidden to enter this section by both the advance and the main signals. Consequently, the mo-



View of Viaduct on Which Accident Occurred



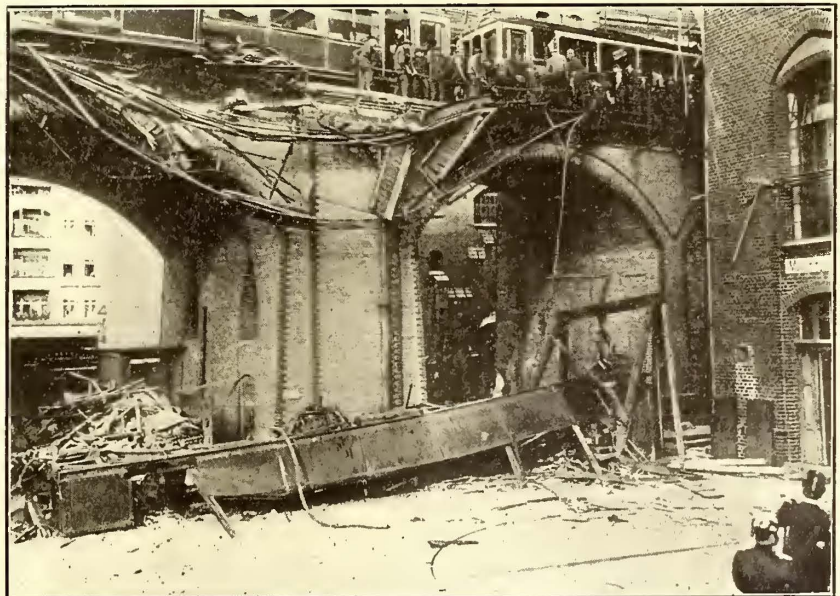
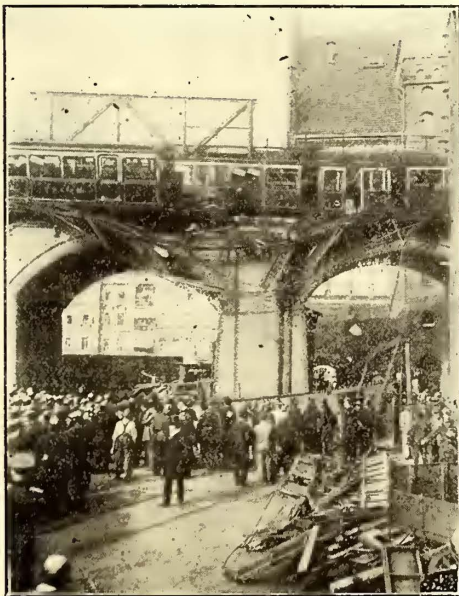
The three-car train from the "Leipziger Platz," which overran its stop signal and brushed the four-car train aside, is shown by the cross-sectioned lines and by the letters "a" and "b." Car "a" was derailed, but was saved from overturning by the structure of the high viaduct.

The four-car train from the "Zoölogical Garden" is shown by the solid black lines and by the letters "A" and "B." Car "A" was pushed over the viaduct, which here has a height of 26.5 ft. Car "B" was derailed, but was retained on the viaduct by the coupling.

Diagram of Viaduct

to a higher viaduct on which they run in the same direction. Views of this viaduct were published in the STREET RAILWAY JOURNAL for Oct. 13, 1900. As a result of the accident 17 persons were killed immediately and 18 severely injured. The force of the collision between the three-car train and the four-car train involved was so great that

torman should have stopped at the head of the triangle and waited for a clear signal. He disobeyed orders by overrunning both signals and reached the switch before the train which had the right of way. The motormen of the trains did not see each other until the last moment, as they were both coming out of different track planes to reach the



Scenes After Accident on Berlin Elevated Railway

one car of the longer train was thrown into the street, 26.5 ft. below, and a second car carried half-way over the structure, while one car of the shorter train was derailed. The accident was caused by the neglect of one of the motormen to obey two stop signals. After an investigation the company issued the following statement:

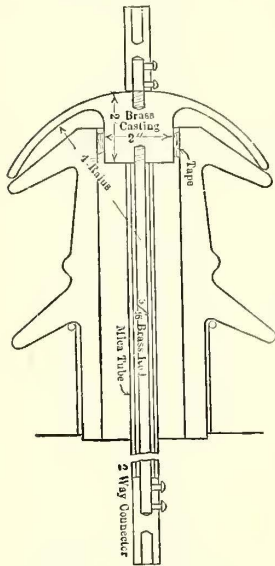
At 1:42 p. m. a train started from Leipziger Platz, running easterly. At 1:39 another train started from the Bü-

low Street station, running easterly, on the same level, and also had between them the large posts of the viaduct. The Leipziger Platz train reached the inner track first, and was struck by the Bülow Street train. The first car of the latter train was immediately thrown off the track, although the motorman applied the brakes at once, after which it broke through the protective railing, struck a corner of the power house, cut through some scaffolding, and then dropped to the street, where it was completely de-

stroyed. Through the fortunate breaking of the first coupling of the car, the second car was not thrown off the viaduct. As the third-rail was short-circuited at the instant of the derailment, the first car of the other train was also derailed and brought to a standstill. The adjacent posts of the viaduct saved this car from dropping to the street.

### ENTRANCE FOR HIGH-TENSION WIRES

At several points on the Boston & Worcester Street Railway Company's system it is necessary to bring 13,200-volt wires into buildings, either used as substations or terminal houses, where the line construction changes from aerial cable to open wire pole work. The accompanying illustration shows an entrance designed by M. V. Ayres, electrical engineer of the company, particularly adapted to buildings with galvanized iron roofs.



High-Tension Roof Entrance

In this construction a high-tension strain insulator of porcelain is mounted in a bushing and surmounted by a brass casting, which is drilled at the top and bottom and threaded to receive a two-way connector leading from the outside circuit, and a 5-16-in. threaded brass rod leading to the inside of the building. The brass rod is surrounded by a 3/4-in. mica tube carried to within about 1 in. of its lower end. The lower end is threaded to receive another two-way connector, from which the inside wiring of the

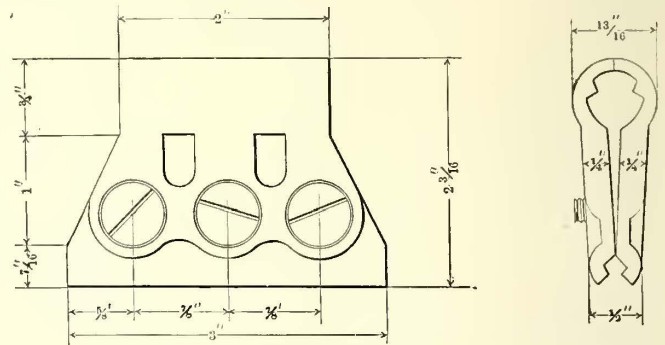
building proceeds on its course. The brass casting is designed to fit several different sizes of insulators, by the use of several turns of adhesive tape as a stiffener between the head of the insulator and the neck of the casting. The casting is 2 in. in diameter, 2 in. high, and is cast in the company's brass foundry to a 4-in. top radius. An air space separates the mica tube from the inner portion of the insulator.

The Boston & Worcester Street Railway Company has had several sets of three-phase high-tension entrances of this general type in use for about four years, and has found them entirely satisfactory. In one case a galvanized-iron hood arranged at the top to receive the insulation, and mounted on a tar and gravel roof, has been in use for two years without giving trouble. Mr. Ayres considers this method of bringing the high-tension wire into a substation decidedly preferable to any of the usual methods of bringing them through the side wall.

According to the present intentions of the Metropolitan Street Railway Company, of Kansas City, most of its cars operated within the city will have been equipped in the pay-as-you-enter style before the winter. This will, however, not include the smaller type car used on one or two lines over which there is not much travel. In the company shops there are now undergoing remodeling several of the larger cars, and as soon as completed it is the intention to put them in commission. At this time it is not known on what line the pay-as-you-enter cars will be installed next.

### SUSPENSION CLIP FOR NEW HAVEN CATENARY

An account is published on page 860 of Section 1 of this issue of the new type of catenary construction being used on the New York, New Haven & Hartford Railroad Company on its main line. The accompanying diagram shows the side elevation and plan of the clip employed. The upper part of the clip as shown embraces the former work-



Suspension Clip for Catenary Construction

ing conductor, while the latter part holds the new steel working conductor which is used on the single-phase system of the company. The two parts of the clip are of malleable iron and are held together by three screws.

### A NEW COUNTING SIGNAL SYSTEM

The United States Electric Signal Company, of West Newton, Mass., has recently placed on the market an improved counting signal known as Type K. The apparatus required for one block section equipped with these signals consists of two signal boxes, four semaphore attachments and four operating trolley switches. The boxes contain both the lights and semaphores for the home signals. The lights are placed in the semaphore cases and are visible through the glass enclosing the same, making a complete and independent visual signal as well as illuminating the semaphore disks at night.

Two sets of home signals are used at each station; one on each side of the main box alternating successively for each car as it enters the block; that is, a car upon entering the block will display one set of the home signals (both lights and semaphores) either on the right or left. Upon the second car entering, another set (both lights and semaphores) will be displayed on the opposite side of the box, and the ones formerly displayed will be restored.

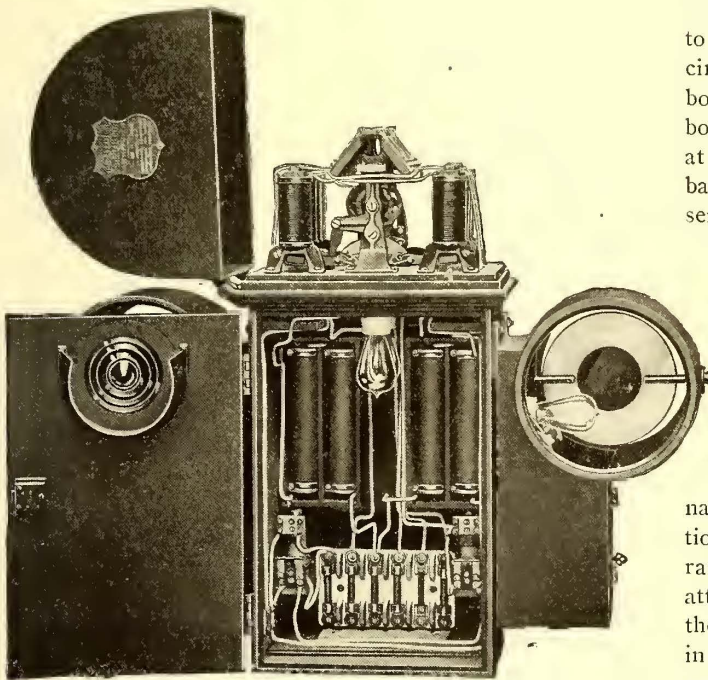
At the distant end of the block a red light only is used for a danger signal. A car upon leaving the block at the distant signal will maintain a red signal set and momentarily display one of the home signals at that end. During this operation the home signal at the entrance end of the block will also be momentarily restored, and the red signal will be momentarily displayed.

The four operating trolley switches used are located over the double track some distance from the junction, so that a car will be able to come to a stop before reaching the junction if it should be blocked by the red signal when entering the block. The setting switches are provided with setting connections only; therefore, if a car should unavoidably pass the switch after the signal had been set from the distant end of the block, it can move back and get into position to proceed and set the signal after awaiting the passing of the coming car, without danger of turning off or restoring the set signal in so doing. The restoring switches are placed on the opposite track, and are provided

with restoring connections only and arc operative only by cars leaving the block.

The signal relay consists of a step wheel, locking devices and four operating magnets and switches governed by their armatures, the two forward magnets operating to set and restore the signal—the one on the right to set and the one on the left to restore.

As the car enters the block the front and right-hand magnet is energized from the overhead trolley switch directly to ground through a resistance of its own, which serves to turn the step wheel one step in the accumulative or setting direction. This operation causes the switch lever to move from the ground contacts on the right to the feed contacts on the left. As the distant end of the circuit is in connection with the ground through the springs on the right at that end, a circuit is thus established and the signals are electrically displayed. When the signals are thus shown, one set of the home signals on the side of the home box is also displayed.



Signal Box Open

The second car, upon entering the block and during the time the first car is yet in the block, will display the set of signals on the opposite side of the box and restore the set that were formerly indicated, thus alternating as heretofore mentioned. At the distant end the red light in the upper part of the box proper will remain constantly displayed during these operations. When the signals are thus set the current will flow through the home box through the home signals and the rear left-hand magnet of the relay at the home box.

This latter magnet at the home box operates the lever which serves to lock the restoring armature lever by cooperating with a pin extending through the same, so that the restoring magnet cannot operate to restore the signals until the signaling circuit is opened. This circuit can only be opened at the trolley switch and by a car passing off of the block. Therefore, if the line should become charged by the crossing of wires between stations, the signals could not be restored on account of this lock. At the distant signal box the signaling current will flow through the red lamp and the restoring magnet.

The pawl or operating lever carried by the armature of the restoring magnet serves as a locking device to prevent the step wheel being turned if a car should by accident run past the setting switch, going on to the block after the signals had been set. By a peculiar arrangement of cooperating pins in the periphery of the step wheel and the side of the restoring pawl, the latter is held up into engagement with the step wheel after the signal has been fully restored, thus maintaining its restored position, and at the same time mechanically holding the armature up to the poles of the restoring magnet.

The signals are restored by a car leaving the block by the overhead trolley switch, from which the current will flow to the rear right-hand magnet of the distant box of the danger or red set signal; thence into the unlocking circuit and to the home box, which has previously been set by cars entering the block; thence through the restoring magnet and through the red signals to ground, thereby charging the first magnet mentioned at the distant or red set signal.

This will cause the switch lever carried by its armature to move over from right to left, opening the main signaling circuit at the spring contacts on the right at the distant box. The locking magnet on the rear left of the home box will then be discharged, allowing the locking devices at the home box to operate to unlock the restoring magnet back toward the point of restoration one tooth, as represented by the outbound car. The circuit opening magnet at the distant box again will close the signaling circuit, and if there are any cars left in the block, charge the left-hand rear magnet at the home box, thereby again locking the armature of the restoring magnet at the home box.

The alternating lever is operated by a notch wheel which is mounted rigidly on the shaft of the step wheel. The latter wheel is mounted loosely, so that it will revolve without rotating the shaft and operate the alternating lever when being rotated in the direction of restoration by a car leaving the block. However, through a ratchet wheel mounted rigidly to this shaft with a pawl attached to the step wheel adapted to engage the ratchet, the shaft can be operated when the step wheel is rotated in a direction to alternate the display of the signals. Consequently, the shaft and the notch wheel that serve to alternate the signals will rotate when operated by a car entering the block.

The main switch lever that serves to set and restore the signals to normal is operated by a cam wheel rigidly mounted directly to the step wheel. Thus it will be seen that the main switch lever does not operate except for the initial setting of the signals by the first car and the final restoration of the same by the last car. This method prevents the signals alternating when the step wheel is rotated in the direction of restoration by a car leaving the block, thereby anticipating any possible danger of displaying conflicting signals by cars entering and leaving the block at the same time.

The Interlaken-Lauterbrunnen-Wengern Alp-Grindelwald rack-and-pinion railway is in process of conversion to electric traction, and it is stated that the overhead trolley, with direct current, will be adopted. The line, which is nearly 15 miles in length, rises to a height of 6700 ft. above sea-level. The conversion of this railway to electricity is being made because of cheap hydro-electric power in the vicinity of the line.

**NEW CATENARY LINE MATERIAL**

A new line of catenary line material is being placed on the market by The H. W. Johns-Manville Company, which includes the features described in the following paragraphs:

The bracket is made up of two pressed steel channels riveted together, having blocks between to give a 3/4-in. space between the two parts. This form was chosen be-

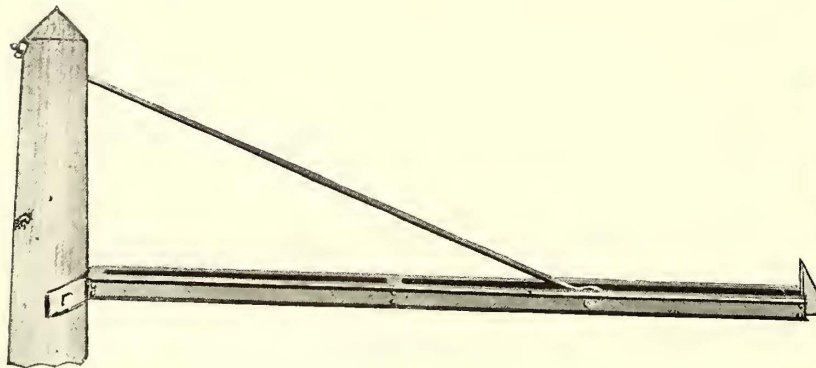


Fig. 1.—Bracket Made of Two Channels

cause an "I" section gives greater strength for the same weight per foot than any other practical form. For instance, its bending strength is over 75 per cent greater than a "T" section of similar proportions and the same weight

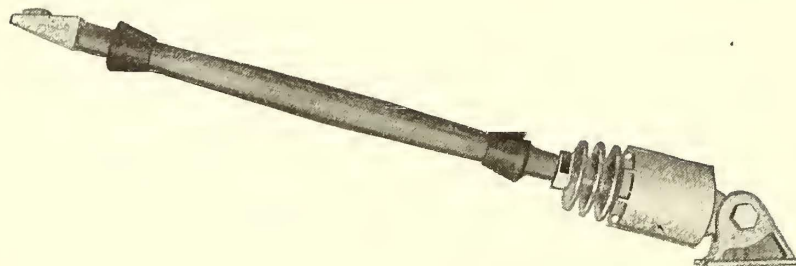


Fig. 4.—Steady Brace

per foot. The pressed channel makes it possible to use stronger steel and the building of an arm of the desired strength with less weight. When using wood poles this feature is highly desirable. In the bracket shown in Fig. 1

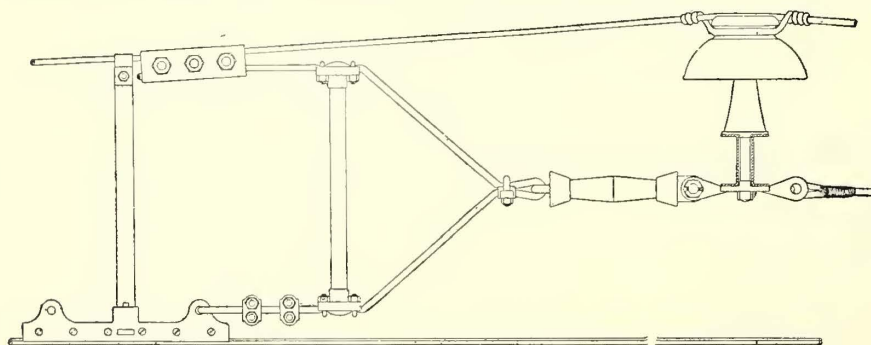


Fig. 6.—Anchor Spreader

the space between the channels furnishes an excellent means of fastening the fittings and tension rod.

The messenger insulator is of the usual high tension type, but much stronger mechanically. The pins rest on top of the bracket arm and are held by a bolt passing between the channels of the arm. For 1200 volts and over the head of the bolt rests in a socket in the top of the pin, as shown in Fig. 3, being held by a bearing plate, lock

washer and nut at the bottom of the arm. In the small size insulator the bolt threads into the bottom of the pin, being also provided with bearing plate and lock washer.

The arm of the steady braces is made of selected split hickory completely dried and impregnated to make weather-proof and preserve its insulation value. For high voltages a special porcelain strain and compression insulator is used, as shown in Fig. 5.

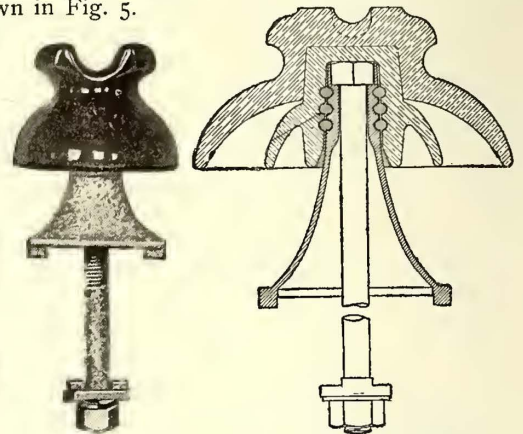


Fig. 2.—Messenger Insulator Fig. 3.—Messenger Insulator for 1200 Volts and Over

Fig. 6, illustrating the anchor spreader, will explain itself. The scheme is to anchor the bracket arm and then anchor the messenger and trolley to the bracket. This prevents pulling the line from the center of the track as when the

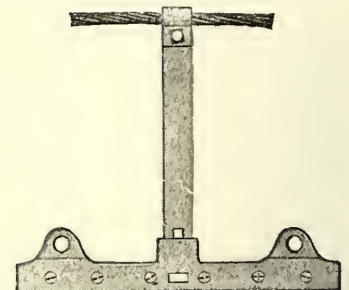


Fig. 9.—Hanger

anchor is placed at the middle of the span. By using a spreader to bring the pull on the messenger and trolley in parallel lines, the anchor point can be made as flexible as any other point.

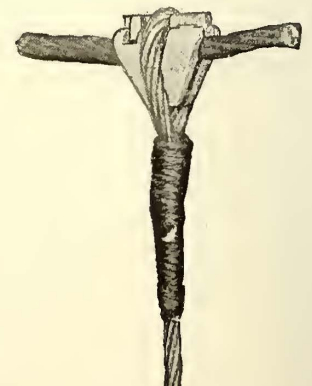


Fig. 8.—Pull-Off Clamp

The pull-off scheme is similar to that for the anchor, except that a pull-off clamp is substituted for the anchor clamp and a pull-off yoke for the anchor ear. The pull-off clamp, Fig. 8, consists of two interchangeable plates having interlocking finger and slot, which partly close about the messenger cable. The pull-off cable, passing over the two parts, tend further to close the wings. This clamps the cable and prevents the pull-off from sliding.



The hanger shown in Fig. 9 is designed to give perfect flexibility to the trolley wire. It consists of two wire clamps, on one of which is a finger which passes through

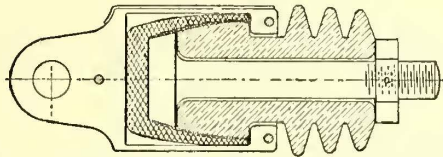


Fig. 5.—Porcelain Strain and Compression Insulator for High Voltages

the hanger strap and the other clamp, with which it interlocks. It not only permits a vertical movement, but allows of a rotary movement about the pin, so that there is no

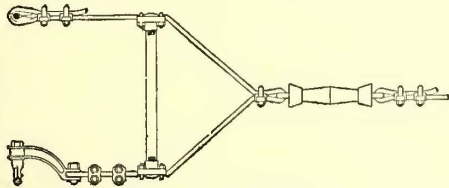
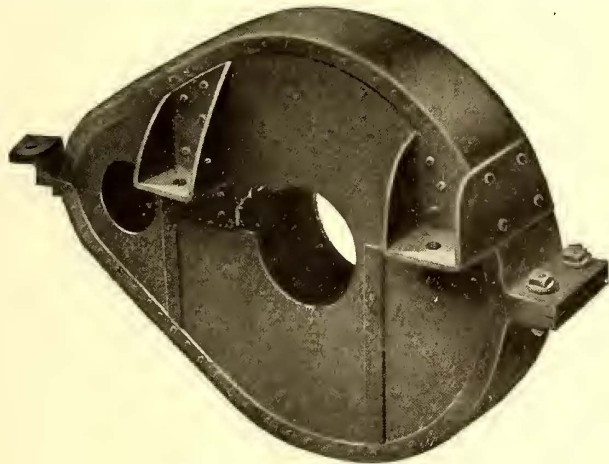


Fig. 7.—Pull-Offs

possibility of a kink forming in the wire, such as often happens with a too rigid hanger. The strap is fastened to the messenger cable by a clip and bolt.

### ALL-STEEL GEAR CASE

The Columbia Machine Works & Malleable Iron Company, of Brooklyn, N. Y., recently has added to its line of gear cases one built entirely of steel. Before placing the new design on the market two of the new cases were given a six-months' trial by the New York & Queens County Rail-



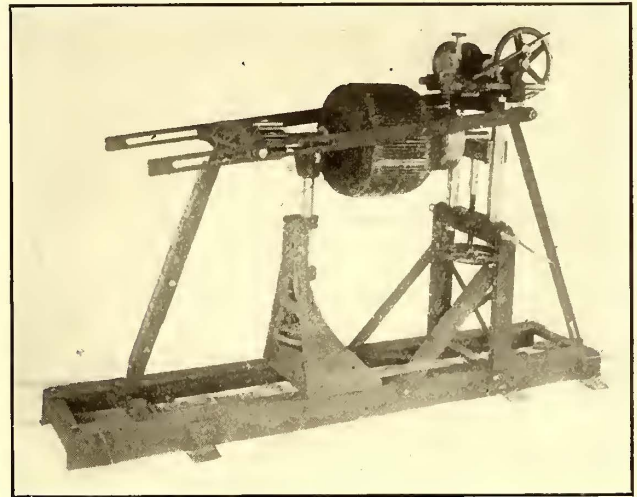
Steel Gear Case

way. These cases were so successful that additional ones were ordered, and since then they have also been installed by the Coney Island & Brooklyn Railway, the Metropolitan Street and Third Avenue railways, of New York, the Chicago City Railway and others.

The new gear case is of substantial construction, and by careful flanging of the top and bottom over the sides and ends it is made dust and watertight. This construction also insures freedom from the losses and annoyances of dripping oil. To insure strength, the ends of the gear case are reinforced and the top and bottom double riveted. A novel feature of the construction lies in the method of carrying the bracket. The latter, which is subject to the greatest strain, is flanged over the casing so that there is practically no shear on the rivets. This bracket is further reinforced on the inside and braced from the bottom.

### COMMUTATOR SLOTTING MACHINE

The shaper of the Peerless commutator slotting machine, made by the Device Improvement Company, Hanover, Pa., is a highly specialized tool which is said to overcome the objectionable features of the circular milling cutter, for which an assortment of tools is necessary, and with which it is difficult to cut close to the shoulder as the teeth become dull. The shaper consists of a heavy steel bed plate upon which are mounted the front and back heads. The back head, or armature support, is a heavy casting adjustable along the bed for various lengths of armatures. The armature revolves on this support on two brass rollers,



Commutator Slotter

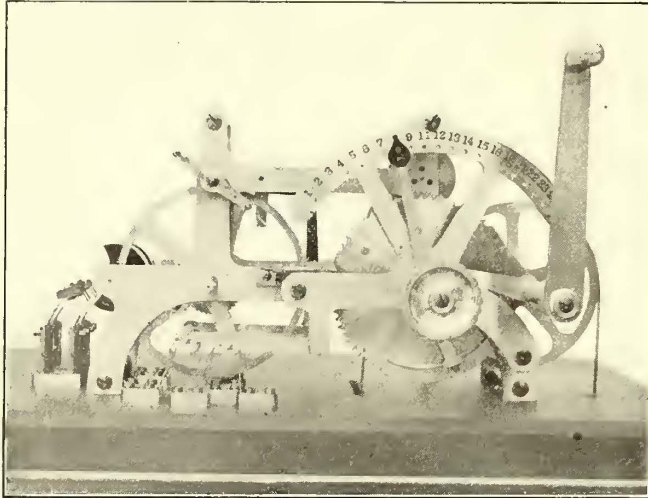
which are adjustable vertically for various diameters. The front head of the machine acts as the support for the armature at the commutator, and also carries the cutting mechanism. It consists of two heavy standards bolted to the bed and rigidly braced. Pivoted to these standards is a heavy casting which is locked by two heavy hand screws, and to which is bolted the heavy steel guides which at the top carry the cutting mechanism proper. Between these two guides is the accurately machined V-slot, adjustable vertically to accommodate various diameters of commutators, and in which the commutator end of the shaft is placed. The two horizontally projecting rods in the upper casting, carrying the cutting head, are adjustable for various lengths of commutators, and are machined absolutely true with this V-slot. The length of the stroke is adjustable by moving the connecting rod pivot out from the center of the gear wheel, and the position of the stroke is accomplished by sliding the connecting rod in or out from this pivot. The crank gear is driven by a small pinion, which in turn is driven by tight and loose pulleys. The cutter is  $\frac{1}{4}$ -in. x  $\frac{1}{4}$ -in. self-hardening tool steel, held by set screws in a holder pivoted between angle guides. A spring insures the return of the cutter to its seat on the back stroke. An adjustable stop assures the slots uniform depth. The front head, which is fed down by a hand wheel into the mica, is braced to the bed by an angle iron, and the thrust of the cutting tool is further taken up by two steel straps to which is bolted the adjustable yoke. This yoke is placed against the end of the armature shaft and locked into position on the thrust rods, and also braced and supported from the rear. The front head, being pivoted at the base of the guide rods, can be swung back out of the way. Armatures can be mounted easily and quickly, and when in position need very little adjusting before starting. The machine will take all sizes of commutators.

**THE DISPATCHAGRAPH SYSTEM**

The Dispatching Signal Company, of Fall River, Mass., is putting on the market a new system of signals for insuring accuracy in the proper transmission of train orders for assisting in the work of handling trains. Experiments have been carried on for the last six years on the New Bedford & Onset Street Railway, and the system has been adopted as the operating medium of the road. It is known as the "Dispatchagraph," and was perfected through the

only one extra wire an advantage is obtained which is not enjoyed by any series system. The dispatchagraph thus not only sets the signal, but sets it in a proper manner, giving all of the advantages of a manned station without the great expense of maintenance. All of the working parts are interchangeable and may be replaced without even a screw driver.

A characteristic tape record made in the dispatcher's



**Transmitter Without Recording Equipment**



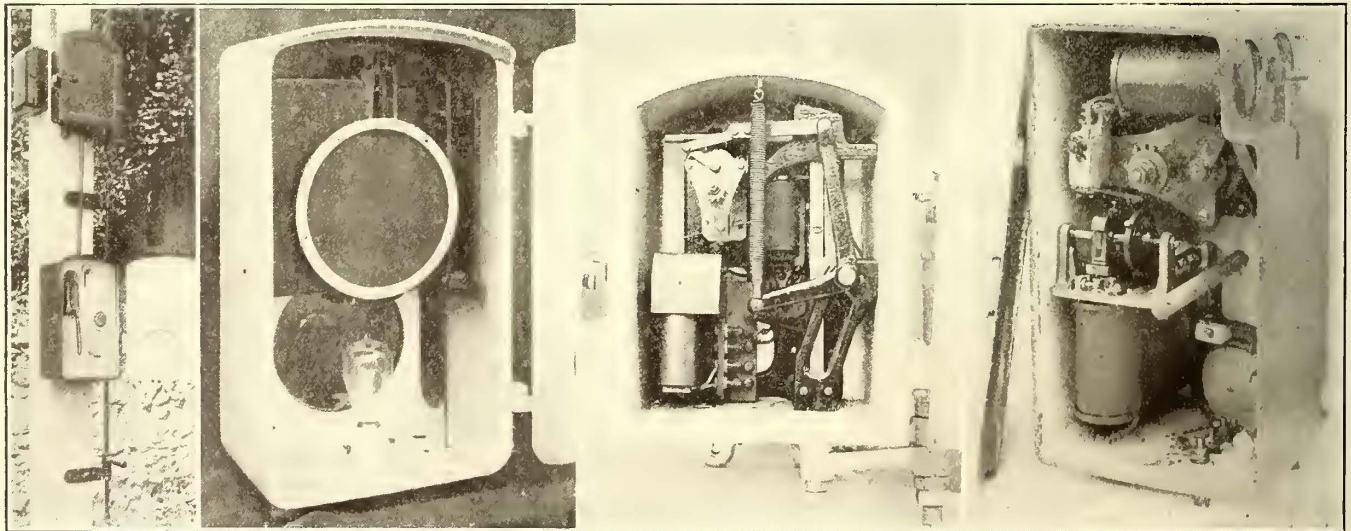
**Dispatcher's Desk With Recording Mechanism**

efforts of O. W. Hart, while the method of use and rules governing its employment were compiled by J. E. Marvelle, division superintendent of the road.

The system consists of a machine in the dispatcher's office which will set a signal at any desired station and receive a record of the time of the interlocking of the signal on a tape, this record being beyond the control of

office is shown in Fig. 1. From this it will be seen that station No. 5 was called Sept. 13 at 4 p. m., and that the answer was given, Station 5 being indicated by five dashes. It also shows by the reply record that the danger signal was thrown at Station 5.

The transmitter is so arranged as first to send more impulses than there are teeth on the selector station wheels.



**Telephone Station and Signal Box**

**Interior of Type B Signal Station**

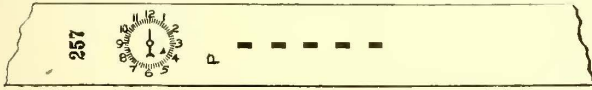
**Interior of Semaphore Signal Station**

**Type B Signal Station, Showing Reply Instrument and Selector**

the dispatcher and only accessible to the management of the road. By an interlocking bolt at the signal station the signal is locked in the danger or stop position until answered by the proper persons or crew. All circuits are operated in a multiple and each station is independent of the other. Orders are transmitted by means of a composite telephone system, which allows perfect transmission as well as signaling in the same circuit, and by the use of

This insures that they make one complete revolution, and all stations are brought to the neutral position. This is a precautionary measure, and is seldom if ever absolutely necessary. The next movement of the transmitter is to release the selector stations, which is done by uni-magnetic means. The number of the station to be called is next sent, and the reply is received, recorded and timed. After this operation enough impulses are sent to make up the differ-

ence between the number of the station called and the number of teeth on the selector wheels, there being one more tooth on the selector wheels than there are stations on the line. The instruments always rest in a normal position which is clear from the line. The effect of the step-by-step system used is to move the instrument one step for each impulse, *i.e.*, the first impulse of the selecting period connects in box 1, or selector No. 1 is in position to set a



Sample Record Received at Dispatcher's Office, Indicating Time and Place

signal; impulse 2 connects in station No. 2 and advances all other stations one step, thus disconnecting station No. 1, etc.

Where magneto telephone stations have already been installed the only thing necessary to make this signal system complete is to run the signal wire and connect the signals.

**INSIDE REINFORCEMENT OF CORRODED POLES WITH STEEL RODS AND CONCRETE**

One of the largest electric railway companies in this country recently determined to strengthen several thousand trolley poles which threatened to become useless from corrosion. After looking into the cost, convenience and efficiency of the several schemes proposed, it was decided to contract for the use of a method the essential feature of which is to strengthen the pole from the inside by reinforced concrete, without disturbing the sidewalk or overhead construction in any manner. This novel departure in the treatment of corroded poles has been worked out by the New York Pole Company, of which G. M. Gest,



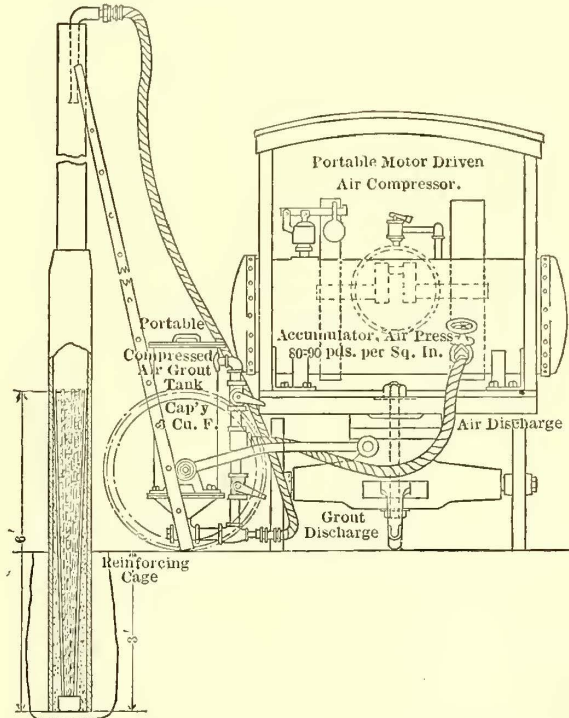
Inserting the Reinforcing Cage and Injecting the Concrete

the well-known conduit engineer, is president. The equipment and operating practice are described in the following paragraphs:

The workmen who reinforce the poles are furnished either with a wagon or ladder and a vehicle which carries a grouting tank and a motor-driven compressed air outfit operated by current tapped from the trolley wire. In repairing a pole the first step is to remove the cap from the

pole and then drop into the latter a reinforcing cage built of high carbon steel twisted bars. At the factory the lower ends of these rods are set in a concrete-iron base, but at the top a hooked cap temporarily confines the upper ends of the rods to allow the cage to pass through the narrower upper section of the pole. Upon the withdrawal of this cap from above the rods flare out against the side of the pole, but are prevented from touching it through the interposition of shims.

The next step is to force the concrete into the pole from



Cross-Section of Pole, Showing Extent of Reinforcement and Arrangement of Grouting Outfit

the grout tank by way of a line of armored hose. When enough concrete to cover the rods has been injected, the pole cap is replaced, and the setting of the concrete does the rest. The size of the rods and quantity of concrete varies, of course, with the degree of reinforcement desired, but in all cases this method brings the advantage of a reinforcement which extends above and below the ordinary limit of corrosion. It has been found that the entire process can be carried out in a few minutes, so that even in the narrowest streets there is no appreciable interference with traffic.

Sections of these poles will be exhibited at the convention in Atlantic City. The New York Pole Company has offices in New York, Cincinnati and Chicago which are prepared to contract for reconstruction of poles in any part of the United States or Canada. The company is also working on a method of outside reinforcement.

Prof. Sydney W. Ashe, E.E., gave on Tuesday, Sept. 29, the first of 25 practical lectures on electricity to members of the Brooklyn Edison Club. The first lecture was entitled "The Coal Pile." The following lecture was on "The Steam Boiler" (Oct. 6), and others will continue in logical order through every branch of power generation, transmission, conversion, distribution and use. The lecturer's remarks will be supplemented by talks by the Edison Company's department heads. Prof. Ashe is now doing similar work for the New York and Boston Edison companies.

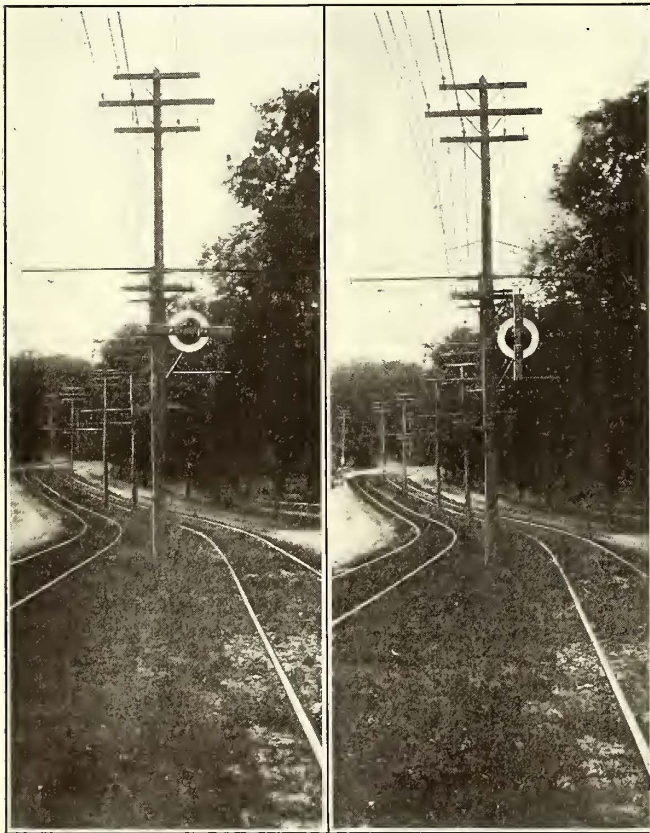
## AUTOMATIC BLOCK SIGNALS ON THE BOSTON & WORCESTER STREET RAILWAY

A new type of automatic block signal is gradually being installed on the Boston & Worcester Street Railway. It was designed by Francis L. O'Bryan, assistant electrical engineer of the railway company, and the first installation was made about 20 months ago, half-mile sections of the road being equipped on a trial basis. At the present time 21 signals are in operation, all being on the double-track section and used as spacing signals.

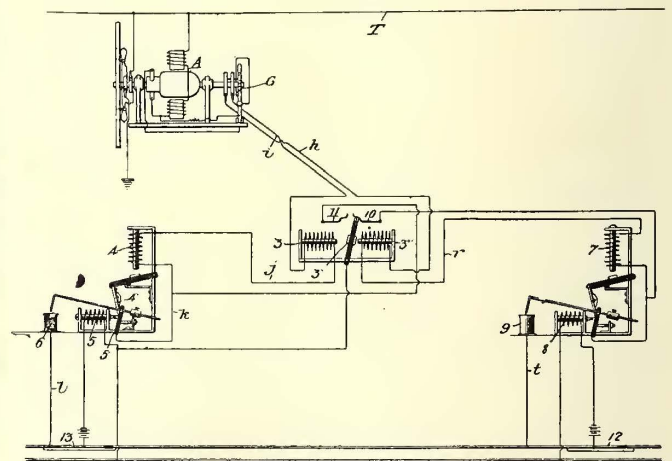
The signal, which is controlled by an automatic track circuit, is illustrated in the accompanying half-tone and diagram of connections. The signal proper consists of a semaphore blade revolved by an electric motor, and indicating danger when in the horizontal position and clear when in the vertical position. Two red incandescent lamps carried by the semaphore blade indicate danger when in a horizontal line at night, and safety when extinguished in a

thereby closing the circuit to the track relay 5, attracting the armature of this relay and closing the contact at 6. This establishes a circuit from feed wire *T* through semaphore motor *A*, circuit breaker *G*, wire *i*, magnet 3, wire *j*, magnet 4, wire *k*, mercury contact at 6, wire *l* to ground, thereby energizing motor *A* and magnets 3 and 4. The semaphore arm is thus swung to the horizontal position by the motor. Magnet 3 of the relay attracts arm 3', so that it engages the spring contact 11. Magnet 4 lifts its armature until detent 4' passes in front of a lateral arm or stop on the armature 5'. When the signal has made one-quarter of a revolution the motor circuit is broken by the circuit breaker *G* and a shunt to the motor armature is closed at the same time, which quickly arrests the movement of the motor. The breaking of the motor circuit likewise de-energizes magnet 4, whose armature falls and detent 4', striking the lateral arm on the armature of the track relay 5, withdraws the armature and thereby lifts the contact arm out of engagement with the mercury cup 6. The breaking of the motor circuit, however, does not affect armature 3' of relay 3, for the reason that this is pivoted at the bottom and remains in any position to which it is moved unless attracted by the magnet opposite the one by which it was last moved. The engagement of springs 11 and 10 with the end of this arm 3' also tends to retain the arm in any position to which it is moved. The signal having been moved to danger by the motor and the motor circuit broken at the commutator contact *G*, and also at the track relay contact 6, another car or train passing over section 13 of the track will not actuate the signal, though it operates relay 5.

As the train which is entitled to the right of way in the



Worcester Block Signal—Figs. 1 and 2, Showing Clear and Danger Positions



Worcester Block Signal—Fig. 3. Diagram of Connections

vertical line. Current for the operation of the signal itself is taken from the 600-volt trolley feed. The motor circuit is controlled by a track relay of sensitive construction, which is operated by current from a battery of Edison BB primary cells, two cells being used ordinarily in each block. Figs. 1 and 2 show the signal in the clear and danger positions, respectively. Fig. 4 shows the semaphore, motor and driving mechanism, and Fig. 5 is a view of the track relay, battery box and auxiliary apparatus of the motor control circuit. Fig. 3 is a connection diagram. The signal apparatus was patented by Mr. O'Bryan in June and is made by the F. L. O'Bryan Company, South Framingham, Mass.

Referring to the diagram of connections (Fig. 3), the operation of the signal is as follows: When a car or train enters the left-hand end of the block section the wheels bridge an insulated rail section 13 and the opposite rail,

block proceeds toward the end of the section, its wheels bridge the insulated rail section 12 and the opposite rail, so that the circuit to track relay 8 is closed, thereby closing contact 9 and establishing the motor circuit as follows: Through the motor *A*, circuit breaker *G*, wire *h*, magnet 3", wire *r*, magnet 7, through wire to contact at 9, wire *t* to ground. This causes the motor to rotate and revolve the signal another quarter of a revolution to the safety position again, at the same time extinguishing the lights behind the semaphore. This movement of the signal places the system in position to be operated by the next train entering the block to set the signal at danger.

Should the current fail in the trolley wire *T* for a brief interval, owing to the blowing of a circuit breaker, or any other cause, while the signal is being operated but has not been completely set, the shunts established around contacts

6 and 9 by relay magnets 3 and 3", afford proper paths for the circuit through the motor as soon as the current is re-established and until the signal has been moved to either danger or safety, as the case may be.

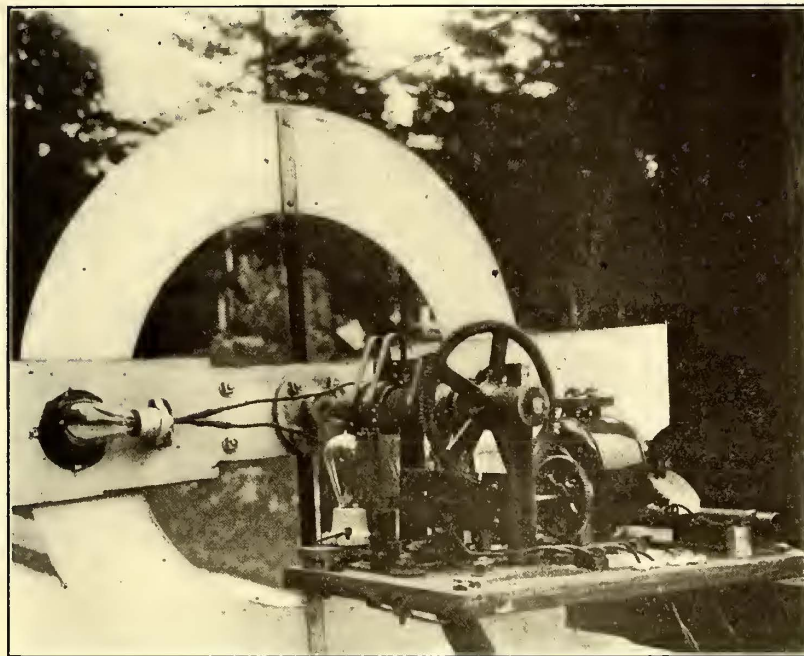
Should a second train be permitted to enter the block while the first train is still in the block it will not interfere with the proper movement of the signals, for, although the first train on leaving the block will clear the signal, it will at once go to danger for the reason that the track relay 5 has been again actuated by the second train to close one break in the motor circuit, the other break being closed as soon as the circuit breaker on the signal moves from engagement with one commutator arm to contact with succeeding commutator arms, thereby completing the circuit through the motor and causing it to continue its movement to set the semaphore at danger. When the second train leaves the block the signal is cleared in the regular way.

This system is applicable to steam railways as well as electric railways. In electric railway service where the

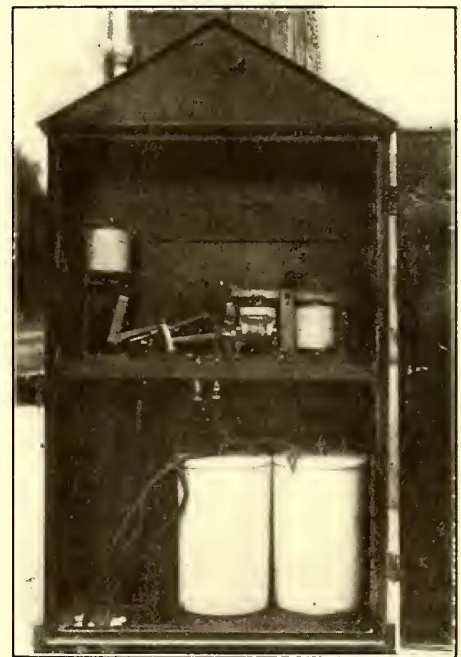
**STREET RAILWAY BRAKES IN EUROPE**

In a paper presented at the Munich convention of the International Street & Interurban Railway Association, Sept. 7-10, the following statistics were given on types of brakes used on the 13,608 motor cars and the 8000 trail cars of the 84 companies replying to the data sheet sent out by the committee on brakes:

MOTOR CARS		
	Cars.	Per cent.
Hand brakes .....	145	1.06
In addition to hand brakes:		
Brakes depending on current reversal.....	431	3.16
Short circuit brakes employed as service and emergency brakes.....	6798	49.90
Short circuit brakes in connection with disc or Sperry brakes.....	2172	15.99
Short circuit brakes in connection with solenoid brake .....	66	0.50
Short circuit brakes in connection with electromagnetic track brakes.....	1828	13.43
Compressed air brakes.....	2113	15.53



Worcester Block Signal—Fig. 4. Automatic Block Signal Semaphore, Motor and Mechanism



Worcester Block Signal—Fig. 5. Relay Case and Battery

rails are used for the return power circuit a bond wire is run around the insulated sections, as shown in Fig. 3.

The track relay is adjusted to work on the Boston & Worcester line in from 1/2 to 3/4 second, but it can be made to work much more rapidly if desired. The maximum speed of the cars on the road is about 54 miles per hour. A white post about 4 ft. high with a red band at the top is used to call the attention of motormen to the beginning of the insulated rail section, which is about 150 ft. from the signal proper. The signal is normally clear and sets on the approach of a car, so that its action can at once be reported in case it does not work properly. The primary cells used for the track circuit last about 12 to 15 months. The semaphore arm is 6 ft. long and from 5 in. to 8 in. wide, papered and painted red. The semaphore motor is rated at 1/8 hp and is worm-gearred to the signal shaft in the ratio of 240 to 1. The worm gearing locks the signal and makes it impossible to move it by external force. The ring behind the arm is circular, 25 in. inside diameter and 35 in. outside diameter.

Compressed air brakes in connection with short circuit or track brakes.....	51	0.40
Gripping brakes .....	14	0.03
Total .....	13,608	100.00

TRAIL CARS		
	Cars.	Per cent.
Hand brakes .....	2389	29.87
In addition to hand brakes:		
Electric disc or Sperry brake.....	1565	19.56
Solenoid or other electric brake.....	2395	29.94
Compressed air brakes.....	1377	17.27
Compressed air brakes with electric brakes	112	1.40
Miscellaneous .....	162	2.02
Total .....	8000	100.00

The conclusions of the committee were that in general hand brakes were sufficient for light cars running at low speed, but that the electric or air brake was necessary with heavier cars at high speed. Mr. Schörling, of the committee, preferred the latter, and Mr. Scholtes, another member of the committee, the former, except when trains of more than two trail cars were hauled.

# News of Electric Railways

## Traction Affairs in Cleveland

Street railway troubles in Cleveland culminated on Friday of last week in the filing of a suit by the Cleveland Railway for the recovery of rent from the Municipal Traction Company for the quarter ended Sept. 30, which was due on Oct. 1. The amount is \$220,134, and the company asks that 8 per cent interest be paid on this sum until the suit is determined by the courts. John J. Stanley, vice-president of the Cleveland Railway, filed the suit through Squire, Sanders & Dempsey. The suit followed the refusal of the Municipal Traction Company to pay the rental on the properties leased from the Cleveland Railway Company, unless satisfactory assurances were given that it would be disbursed to stockholders as dividends. On Wednesday, D. C. Westenhaver, counsel of the traction company, went to the office of Henry J. Davies, secretary of the Cleveland Railway, with certified checks for the rent and a letter from Treasurer Tom L. Johnson, stating that the checks would be endorsed if assurances were given that the cash would be used as dividends. Both Secretary Davies and Vice-president Stanley refused to make any promises whatever and Mr. Davies made a formal demand for the rent. On Thursday Mr. Davies called President duPont of the Municipal Traction Company to his office and made a formal demand for the money, as provided in the lease. Mr. duPont referred Mr. Davies to Treasurer Johnson's letter, written the previous day.

Following the second demand, Mr. Johnson carried out a promise contained in his letter that he would mail all the stockholders of the old Forest City Railway and those to whom stock of the Cleveland Railway had been sold through the private stock exchange checks equal to their dividends for the quarter. These checks contained an order on the Cleveland Railway Company for the amounts, whenever the rent is paid to that company, and the recipients were asked to sign this order before depositing the checks. This, of course, makes the Traction company comparatively safe, although no account is taken of the matter in the suit that has been instituted. Officers of the Cleveland Railway stated that the Traction company is at liberty to make any advances it may see fit, but the payments made are considered only in that light.

It appears, from all that has transpired, that officials of the Cleveland Railway consider that the Traction company has nothing to do with the disposition of the money received for rental. The books had not been closed and no dividend had been declared on the stock up to the time for making the payment. This situation made Mayor Johnson determined to withhold the payment, it is said. With the *Cleveland Press* he had guaranteed some of the stock of the Forest City Railway, and the stock sold through the private exchange had been guaranteed also. Had the Cleveland Railway Company passed the dividend, Mr. Johnson and the *Press* would probably have become liable for these dividends. As it is, the Traction company now has on hand about \$200,000, after paying the dividends on the guaranteed stock. Whether the Cleveland Railway will be willing to recognize the legality of this action remains to be seen.

In discussing the matter, F. H. Goff, arbitrator for the Cleveland Railway in the valuation proceedings, said that those taking part in the settlement understood that all the money received for rentals was to be applied to dividends, and that, under the circumstances, he would probably have acted as Mayor Johnson has done. He added that conditions may have arisen since the settlement was made that could not be foreseen at that time, which had caused the directors of the old company to decide upon passing the dividend in order to have the money for other purposes. The rental is substantially all the money the company receives, and any funds to be used for other purposes would have to be raised in some other manner if the rental is all paid out in dividends to the stockholders. Uncertainty as to the results of the referendum vote on Oct. 22 may have had some influence on the matter. Should the properties revert to the Cleveland Railway Company, it would be necessary to have working capital, and the company is said to be uncertain as to whether any money would be returned with the properties, although about \$700,000 went to the Municipal Traction Company when it acquired control.

President Horace E. Andrews, of the Cleveland Railway, made a formal statement on his arrival from the East to the effect that there is neither a moral nor a contract obligation on the part of the company to pay the rental out in dividends if the directors feel that it is to the best interests of the stockholders to reserve the money for other purposes.

He said that the directors are responsible for the protection of the property; that when the lease was made no date for a referendum vote had been fixed and that conditions have changed since that time. He did not indicate that the directors would hold a meeting or that anything would be done at this time regarding the matter. The inference is that the directors expect to take such action as will make the property safe in case the people defeat the security franchise and leave the company with the property and a limited number of franchises.

A meeting of the attorneys named to consider a plan for trusteeing the stock of the Municipal Traction Company was held on Thursday and an agreement was reached, which has been accepted by the directors of the Traction company. It is stated that a trust can be arranged that will throw safeguards about the company without conflict with existing laws. The attorneys suggest, however, that rather than have the owners declare a trust, the stock should be conveyed to a third party and then reconveyed to the trustees in trust. Attorney Westenhaver, of the Traction company, will work out the details of the proposed deed of trust.

Before the meeting was called, Attorneys Tayler, White and Tolles had prepared a report embodying their conclusions, and this was presented to Attorney Westenhaver and City Solicitor N. D. Baker. It embraced an extended examination of authorities on the subject and the reasons for the conclusion that a trust could be formed. The basis of the report is that the grant has a value of millions of dollars and that there would be a temptation, at least, to evade present safeguards. The security grant is assignable, as stated in this report, and cannot be made non-assignable. Although the lease is not assignable by the Municipal Traction Company, property acquired under its provisions, such as Cleveland Railway stock, is not thus limited. This stock is scattered so widely that it would be almost impossible to combine it under a trust agreement. However, there seems to be no way to prevent the persons controlling the leasing company from acquiring a majority of the stock of the Cleveland Railway Company and then violating the terms of the lease, thus allowing the property to revert to the railway company under the security grant that provides a 5-cent fare and six tickets for 25 cents. These persons might thus receive the full benefit of that grant personally, which was not the intention of the people nor the representatives of the Railway company when the settlement was made. The attorneys stated that no action could be taken that would change the corporation into one not conducted for profit, nor was it believed that the present stockholders could take any action that would allow the property to be taken from them or change the plan of bettering the service and lowering the fare.

The attorneys pointed out that the option held by a majority of the stockholders on the stock of each stockholder could be terminated at any time by joint action of all the stockholders, as a balance of right to buy and sell is created by all giving the option which neutralizes the effect of the action. All options expire in 18 months from the time the property was taken over and the owners are under no obligation to renew them.

President Howe, of the Cleveland Chamber of Commerce, has appointed a committee, consisting of prominent members, for the purpose of making a thorough investigation of the street railway situation and making a report to that organization. From this report, advice will be formulated as to the manner in which members should consider the matter when the referendum vote is taken. Work was begun this week, the books of the Traction company being taken up first. The officials have promised the committee all the aid that can be given them in the investigation.

Mr. Goff says that if employees of the Traction company are to secure and hold their positions by virtue of political affiliation or through any promises of political favor or support the holding plan will be a failure. Regarding the personnel of the board of trustees, he says that the directors of the Traction company should be allowed to select not to exceed three of the seven members, so that the balance of power may be with those who are not in any way connected with the company. He believes that Mayor Johnson and City Solicitor Baker ought to act on the board and that the other members should be broad-minded men of affairs; a judge of the State or United States courts, the president of the Cleveland Chamber of Commerce and other men holding like positions of honor are suggested. Mr. Goff thinks that the directors of the Traction company should not be trustees also, as was suggested by Mr. Tolles

and Mr. Westenhaver. Mr. Goff believes that a board of trustees such as he suggests will see that the street railways are operated in accordance with the ideas of the people.

It is suggested that the profits on the stock in the hands of trustees under this plan be devoted to maintaining the municipal light plant, but an alternative plan will also be named, so that a change in the lighting arrangements would not affect the purpose of the trust.

In the second issue of the *Public*, the paper published by the Municipal Traction Company, it is stated that \$93,872.30 was spent in August for maintenance and betterments. This is placed under the head of maintenance in the report. Since April the company has spent \$376,864.95 for this purpose, of which \$136,000 has been used in the purchase of new cars, transforming old cars into cars of the pay-as-you-enter type and increasing the motor power. For repair and betterment to tracks \$123,414 has been paid out. In addition to this, it is stated that the tracks on Central Avenue and Quincy Street cost \$154,000, and \$170,000 has been expended for new work scattered over the city. In four months, it is stated, a total of \$950,000 has been spent in repairs, betterments, improvements and new construction.

Regarding the results of 3-cent fares the paper says that nearly \$100,000 a month or nearly \$1,000,000 a year is being paid by the people now in excess of all charges to improve the system. It is claimed that if the property was operated as other street railway property is operated, the company would have a surplus greatly in excess of what is shown by the reports.

Referring to the rush-hour problem, the paper states that the Traction company is carrying about 400,000 passengers a day and that half of this work must be done during the rush hours morning and evening. It would require 1200 extra men, it is claimed, to give all passengers a seat during these hours. As the men would have work only a few hours a day, they would earn only 50 or 75 cents and this would not be enough to support them. The solution is to be found in increasing the capacity of the cars, it is stated, if a remedy can be found at all. The company is doing this by the use of trailers on some of the lines. In certain cases two cars are attached to the motor car.

The paper says that some of the lines earn 26 cents a car-mile gross, while others earn less than 15 cents. Some lines earn but 10 cents a car-mile at certain hours of the day, and at other times as high as 75 cents a car-mile is earned. The frequency of the schedule, it is stated, has been adjusted to meet the needs of traffic. The company believes that the Cedar, Superior, Detroit, Bridge, Scovill, Euclid and St. Clair lines should have a service commensurate with their earnings, and that the same rule should be applied to Union, Fairfield, Scranton and some of the other lines which show a loss.

#### Plan to Build Freight Subway in New York

The Amsterdam Corporation of New York, the president of which is W. J. Wilgus, formerly vice-president of the New York Central & Hudson River Railroad, submitted last week to the New York Public Service Commission, First District, a plan for eliminating the New York Central tracks on the west side of Manhattan Island by the substitution thereof of an electrically operated 4-track subway, which would be part of a complete belt line subway for freight and express traffic running completely around the waterfront of New York City. These tracks would connect with the New York Central freight tracks at Sixtieth Street and the North River, and run thence south along the North River to the Battery, and thence north along the East River to a connection with the New York, New Haven & Hartford Railroad in the Bronx. A crosstown line below Forty-second Street to connect the East and West lines would form a complete circuit and would connect by tunnel under the North River with a freight classification yard back of the Bergen Hills in New Jersey, where the freight could be assembled and handled by the railways terminating on the Jersey side of the North River. The whole belt line would be built beneath the sidewalks of the business district of Manhattan and connected by high-speed routes with the principal rail and water carriers.

From the riverfront subway freight belt line around Manhattan Island, cartage tunnels would extend under the sidewalks directly to the buildings occupied by receivers and shippers of freight. Incoming freight would be transferred in the classification yard in New Jersey into 10-ton cars electrically operated. These cars, passing through the tunnel under the river and along the main belt line, would enter directly by cartage tunnel the buildings of receivers of the freight. Outgoing freight would be loaded into the cars in the buildings of the shippers and would go to the classification yard for transfer to its destination in the country. The plan is accompanied by arguments. From

an abstract of the material submitted the following is quoted:

"It is well known that the principal part of the business of the city of New York is located upon the portion of Manhattan Island south of Forty-second Street, in an area about four miles long by an average of two miles wide. This small territory is the center of a growing population of 5,000,000 people, a large portion of whom pour into this business section each morning, returning to their homes at night. To accommodate business requirements, buildings are being erected to enormous height; while to meet the demands of passenger transportation, subway, street and elevated railroads have been created, together with bridges over and tunnels under the rivers. Yet the streets, morning and evening, are rendered almost impassable by the tide of human traffic which meets, and is checked by the vehicular traffic made necessary to transport through the streets the enormous freight tonnage of the business district. The inevitable rapid increase in the number of people who will daily enter this already congested business zone, makes it desirable and necessary to clear the streets as much as possible of freight traffic, in order to facilitate the rapid movement of pedestrians and street cars."

#### Organization of Railway Manufacturers

A meeting of representatives of corporations and individuals engaged in the manufacture of steam railroad supplies was held at the Waldorf-Astoria, New York, Sept. 30, to form a permanent organization to combat the public feeling against railroads, so that the business of the manufacturers, which has suffered in the past year, may be improved. The name selected for the organization was the Railway Business Association, and its offices will be at 2 Rector Street. It was estimated that there were present at the meeting representatives of hundreds of millions of capital and the employers of over 200,000 men.

The movement was started by a letter sent out on Aug. 5 to all the leading manufacturers of the trade by Otis H. Cutler, president of the American Brake Shoe & Foundry Company; Charles A. Moore, president of Manning, Maxwell & Moore; J. S. Coffin, president of the Franklin Railway Supply Company, and George A. Post, president of the Standard Coupler Company. It declared that the aims of the organization would be "to advocate and in all honorable ways endeavor to secure fair play to railways in matters of Federal and State legislation; to favor such adjustment of transportation rates as will be equitable and adequately remunerative to the railways, to arouse among all those who make their living by serving railways and the manufacturing interests allied therewith a sense of active loyalty to their common interests, which shall manifest itself in defense thereof when subjected to unjust attack." Among the speakers at the meeting were George A. Post, of the Standard Coupler Company, and Col. H. G. Prout, of the Union Switch & Signal Company.

The following were elected officers of the new organization:

President, George A. Post, president of the Standard Coupler Company; vice-presidents, H. H. Westinghouse, vice-president Westinghouse Air Brake Company, Pittsburg; O. H. Cutler, president American Brake Shoe & Foundry Company, New York; W. H. Marshall, president American Locomotive Company, New York; E. D. Keith, president Keith Car Manufacturing Company, Sagamore, Mass.; A. H. Milliken, president Pettibone-Milliken Company, Chicago; O. P. Letchworth, president Pratt & Letchworth Company, Buffalo; treasurer, Charles A. Moore, president Manning, Maxwell & Moore, New York.

The following executive committee was also chosen: W. G. Pearce, vice-president Griffin Wheel Company, Chicago; W. V. Kelley, president American Steel Foundries, New York; H. G. Prout, vice-president Union Switch & Signal Company, Pittsburg; J. S. Coffin, president Franklin Railway Supply Company, Franklin, Pa.; N. Paul Fenner, Jr., president American Valve & Meter Company, Cincinnati; E. L. Adreon, vice-president American Brake Company, St. Louis; J. H. Schwacke, vice-president William Sellers Company, Philadelphia; M. A. Kittredge, vice-president Barney & Smith Car Company, Dayton, Ohio, and J. F. Dixon, president Dixon Car Wheel Company, Houston, Tex.

#### Officials of Chester, Pa., Censured for Failure to Prevent Strike Disorder

The grand jury of Delaware County, in a report filed at Media, Pa., on Oct. 2, censured officials of Chester for failure to perform their duties when the first evidences of disorder were apparent, following the recent strike of the trainmen of the Chester Traction Company. The jury said in its report:

# Financial and Corporate

## New York Stock and Money Market

Oct. 6, 1908.

During the last week the tendency of the stock market has been steadily upward and the tone has been strong and buoyant. Life and interest have been displayed among the traders, although there is not, as yet, much evidence that the public is inclined to take hold. The large number of small sales indicates that traders, other than the large interests that have supported the upward movement, are doing some buying. While almost all stocks, except in instances where there has been some especial reason for depression, have recorded advances during the week, the principal upward movement and activity have been in the issues of the small group of corporations which have been especially favored since the advance began last spring.

The European war scare has been a general topic of conversation, and possibly may have done something to check the advance. The foreign markets showed temporary disturbance, but even in the European centers the news had been discounted far enough in advance to prevent anything like demoralization. The large traders are again back of the market and they are able to sustain prices and to check any break before it can become serious.

On Oct. 6 the market was a trifle less active and a little more uncertain. The announcement of the plan devised by Speyer & Company for extending the St. Louis & San Francisco notes, amounting to \$7,100,000, due Dec. 1, for one year, had an immediate effect upon the issues of that company and also upon Rock Island preferred, which closed the day with a net advance of 4½ points. Money rates were again easy and loans were made on call freely at 1 to 1¼ per cent; 90-day paper was quoted at 2¾ to 3 per cent.

### Other Markets

Rapid Transit stock has been the leading traction that has displayed activity during the last week in the Philadelphia market. In this issue there have been fairly liberal sales every day and the price has been gradually upward. The last quotation on Oct. 6 was at 20¾, which is near the high figure, a few shares having been sold previously at 21.

In the Boston market traction securities attracted little attention. Small blocks occasionally appear in the market, but there is neither any eagerness to sell nor active desire to buy. Boston Elevated is steady at 33¾, and there have been some sales of Massachusetts Electric preferred at 51½.

In the Chicago market traction securities were almost entirely neglected. Little stock was offered for sale and buyers are apathetic. City Railway is nominally quoted at previous prices, and small lots of Metropolitan Elevated common have been sold at 13¼.

United Railways securities, as usual, were the only active points in the Baltimore market. The bonds continued to be the leading feature, the 4s being sold at 84¾ to 85. The income bonds sold at 52 and the 5s at 78¾. There was some trading in United Railways stock at 10¾ to 10½.

The most active security on the Cleveland Stock Exchange during the week were the pooling certificates of the Washington, Baltimore & Annapolis road, but the price did not exceed 9½, except for future delivery. Several blocks of Aurora, Elgin & Chicago preferred changed hands at 80, which is about where the price has stood for some time. No trading in Cleveland Railway of importance has taken place. The bid price stood around 80, with 88 and 89 asked.

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

	Sept. 29.	Oct. 6.
American Railways Company, Philadelphia.....	44	44¾
Boston Elevated Railway.....	132	133¾
Brooklyn Rapid Transit Company.....	46¾	48¾
Chicago City Railway.....	ar180	ar180
Consolidated Traction Company of New Jersey.....	a67½	—
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	ar104	—
Detroit United Railway.....	38	39
Interborough-Metropolitan Company.....	10½	10½
Interborough-Metropolitan Company (preferred).....	32	31½
Manhattan Railway.....	138	134
Massachusetts Electric Companies (common).....	10	—
Massachusetts Electric Companies (preferred).....	52	51½
Metropolitan West Side Elevated Railway, Chicago (common).....	a13	a14
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a45	a44
Metropolitan Street Railway.....	28	24½
North American Company.....	61	62¾
Philadelphia Company, Pittsburg (common).....	39	39
Philadelphia Company, Pittsburg (preferred).....	40	40¾
Philadelphia Rapid Transit Company.....	19¾	20½
Philadelphia Traction Company.....	*88	88¾
Public Service Corporation, 5 per cent collateral notes.....	a97	—
Public Service Corporation, certificates.....	a70	—
Twin City Rapid Transit Company, Minneapolis (common).....	85½	89
Union Traction Company, Philadelphia.....	47	48¾

\* Asked.  
\* Last sale.

"We have had full opportunity to investigate the causes that led up to the disorder prevailing recently throughout the southern part of our county, from which came the greatest number of indictments that were laid before the grand jury to pass upon, thereby occupying the attention not only of the courts, but the whole administrative force of the county's peace officials, with the extraordinary expenses attached; also a notoriety which all good citizens should abhor.

"In our judgment these conditions were brought about by the failure of the executive department, consisting of the mayor, chief of police and sergeant of police of Chester not performing their sworn duties when the first evidence of disorder presented itself. As to the differences between the corporation operating the street-car franchises and their employees in our county, said differences being a matter between them of a business character, entirely within their provinces, we do not see that we have any right whatever to interfere in giving expression to the respective merits of their differences; but when either party thereto or any one else in our county, by any action whatsoever, attempts to set up a defiance of the statutes and assist a power of any character contrary to law, it is then our duty to take notice and bring to the attention of the courts any such whom have in any way shirked their duties as public peace officials or in any manner evaded the duties which they had sworn to perform.

"After a searching inquiry in the grand jury room in the many police cases which came before us we cannot do otherwise than mention the fact that from the large number of truc bills returned, there was a great number of people who were not peace officers who did not do their duty as citizens, particularly those who failed in rendering assistance to those whose duty it was to preserve the peace and who now must realize the fact plainly that law and order are opposite forces."

**First Through Car Run on Chicago & Milwaukee Line.**—The first car to Milwaukee over the Chicago & Milwaukee Electric Railroad Company's line, carrying a party of officials from Chicago, was operated on Oct. 1.

**Vancouver Line Opened for Traffic.**—The street railway system of Vancouver was formally opened to traffic by the Vancouver Traction Company on Sept. 26, when an official party made the initial run over the 2½ miles of track.

**Meeting of American Society of Civil Engineers.**—At the regular meeting of the society on Oct. 7 ballots for membership and ballots on the proposed amendments to the Constitution were canvassed, and the paper (printed in "Proceedings" for August, 1908) entitled "Catenary Trolley Construction," by Oliver S. Lyford, Jr., was presented for discussion and illustrated with lantern slides. A collation, provided by subscription of resident members, was served after the meeting.

**Ask Revision of Plan of Taxation in Washington.**—Electric railway companies of Washington presented a plan to the State Board of Equalization at Olympia, Wash., recently which they ask to have adopted in lieu of the scheme followed by the State Tax Commission in assessing their properties. The Tax Commission fixed the taxable value of the electric railways at \$23,489,229. An arbitrary value was assumed, of which the net earnings were 7 per cent. Upon the value ascertained in this way, 60 per cent was computed as the assessed value. Representatives of the railways said that 70 per cent of the gross earnings was required for operating expenses and taxes. They contended that they were entitled to earn 8 per cent instead of 7 per cent. The electric railroads objected to being taxed at 60 per cent of the assumed value, insisting that other property is not taxed at so high a rate. Attorneys argued that the Tax Commission's figures, if adopted, would be confiscatory, as no electric railway under present conditions could afford to pay the amount of taxes that would be levied.

**Conclusion of the Fender Tests at Schenectady.**—The first series of tests of street car fenders and wheel guards conducted by the Public Service Commission (First District) of New York was concluded at Schenectady on Friday of last week. Of the 38 entrants, 28 appeared and submitted their devices to the prescribed tests. The device of one inventor was disqualified before subjecting it to any tests on the ground that it was not suitable for practical application to cars. In the 15 days during which the tests were conducted 35 different devices were tested, requiring 962 separate tests. The two cars used ran 148 miles. Beginning Oct. 20, a second series of tests will be conducted under similar conditions at the works of the Westinghouse Electric & Manufacturing Company, East Pittsburg, Pa. The list of entries for this series has not yet been announced.



**Annual Report of the Spokane & Inland Empire Railroad**

Revenues from operation and from other sources of the Spokane & Inland Empire Railroad, Spokane, Wash., during the year ended June 30, 1908, amounted to \$1,139,186. The gross revenue from operation alone amounted to \$1,118,018 and 72.2 per cent of this amount, or \$807,388, was expended for operating expenses and taxes. Gross earnings from freight aggregated \$291,008, or 26 per cent of the total gross revenue from operation. The statement of operations contained in the report compares as follows:

Year ended June 30.	1907.	1908.	Increase.
<b>Earnings from operation—</b>			
Freight .....	\$144,262.47	\$201,007.58	\$146,745.11
Passenger .....	287,846.93	516,070.90	228,223.97
Earnings from street railway system and miscellaneous earnings.	225,745.63	310,939.16	85,193.53
<b>Total .....</b>	<b>\$657,855.03</b>	<b>\$1,118,017.64</b>	<b>\$460,162.61</b>
Operating expenses, including taxes	408,311.38	807,388.20	399,076.82
<b>Net operating earnings.....</b>	<b>\$249,543.65</b>	<b>\$310,629.44</b>	<b>\$61,085.79</b>

Jay P. Graves, president of the company, says in his statement to the shareholders:

"Since our last annual report the country has passed through a very trying time, and your property has been more or less affected by the curtailing of business and the difficulty of obtaining necessary funds to complete extensions which at that time were under way.

"Work on the extension of the Inland division from Palouse to Moscow was stopped for six months. This work was taken up in the spring and is now completed, and we commenced operation of that extension on Sept. 15. I look for very good results from this extension, as Moscow is the third largest town in Idaho, and will be the largest town outside of Spokane on this division.

"Our power plant has been completed and two units of 5000 hp each have been installed, and the Spokane & Inland division is now operated by power generated at our own power plant. This will make a good saving in operating expenses on this division.

"The company has acquired right of way from the power plant to the city limits, over which our transmission line is built. This right of way was selected on a grade which will permit of our building an electric road on it at some future time.

"We are pleased to be able to report steadily increasing receipts on the different divisions. The Traction division shows an increase of 38.3 per cent in gross receipts, while the Coeur d'Alene division shows an increase of 12.4 per cent. This latter increase is exceptional, in view of the fact that the lumber and mining interests in the Coeur d'Alene country were very badly affected by the panic, and the closing of the lumber mills and many mines had a big effect on the earnings of this division. The Inland division also shows a large increase in business, but a comparison cannot be made which would be of any value on this division, owing to the fact that only part of the road was in operation a year ago. The increased mileage on the Inland division also accounts for the increase shown in the operating expenses of the system.

"With the opening of the Chicago, Milwaukee & St. Paul road in the Palouse country next year, the extension to Moscow completed and the increase in population along the line of this division, which increase has been stimulated by the electric railroad, we may look for a large business during the year 1909.

"The double tracking of a part of the Coeur d'Alene division was completed late this spring. Some 2 miles of extension of the Traction division have been constructed.

"The physical condition of the properties has been kept up to the highest standard, and additional equipment has been added when needed. The total expenditure for the year for new lines and extensions, equipment and additions and betterments, has been \$1,746,417, of which \$333,141 was expended on power plant and \$152,958 for extensions and equipment of the Traction system, and the balance, \$1,216,318, upon the Inland and Coeur d'Alene divisions, including their terminals.

"It is expected by the management that the earnings of the company will warrant the resumption of dividends on the preferred rights during the year 1909, if business continues to improve as it has in the past 90 days."

Following are the traffic and mileage statistics for the year:

<b>Passenger—</b>		
Number revenue passengers carried.....	1,096,817	
Number revenue passengers carried 1 mile.....	25,089,489	
Number revenue passengers carried 1 mile per mile of road.	167,263	
Average distance carried—miles.....	22.88	
Total passenger revenue.....	\$488,605.83	
Average amount paid by each passenger—cents.....	44.55	
Average rate per passenger per mile—cents.....	1.95	
Total passenger earnings, including mail, baggage and express	\$516,070.90	
Mileage of passenger cars.....	1,513,521	

Mileage of passenger trains.....	713,039
Passenger earnings per train mile—cents.....	72.37
Passenger earnings per average mile of road operated.....	\$3,440.47
<b>Freight—</b>	
Revenue tons carried.....	331,594
Revenue tons carried 1 mile.....	11,574,193
Average distance haul 1 ton miles.....	34.9
Total freight revenue.....	\$291,007.58
Average amount received per ton freight—cents.....	87.76
Average receipt per ton per mile—cents.....	2.51
Mileage of loaded cars.....	644,597
Mileage of empty cars.....	419,055
Total mileage.....	1,063,652
Mileage of freight trains.....	188,755
Freight revenue per train mile.....	\$1.54
Freight revenue per average mile of road operated.....	\$1,940.05
<b>City Traction System—</b>	
Revenue passengers carried.....	5,790,893
Passenger car mileage.....	1,396,472
Passenger earnings.....	\$286,476.25
Passenger earnings per car mile—cents.....	20.5

**Street Railways of the New York, New Haven & Hartford Railroad**

The balance sheet of the New York, New Haven & Hartford Railroad, as of June 30, 1908, contained in the annual report for the fiscal year ended that date, shows that the cost of street railroads and equipment, including investments in the Rhode Island Company, the Connecticut Company and the New York & Stamford Railway, is \$58,533,367. Improvements and betterments were made upon the street railroads during the year at an aggregate cost of \$2,489,430. Earnings and expenses of the Connecticut Company and the Rhode Island Company, which respectively operate the street railway properties of the New Haven company in the States named, were as follows during the year:

	Connecticut Company.	Rhode Island Company.
<b>Earnings:</b>		
Passenger .....	\$6,221,160	\$3,943,430
Mail .....	8,567	2,231
Express .....	137,464	*142,842
Chartered cars.....	28,302	13,048
Sale of power.....	41,822	55,775
Park earnings.....	63,255	.....
Advertising .....	26,002	15,355
Miscellaneous .....	†764,367	21,822
<b>Total earnings.....</b>	<b>\$7,290,939</b>	<b>\$4,194,503</b>
<b>Operating expenses:</b>		
Maintenance of way and structures.....	\$709,124	\$319,732
Maintenance of equipment.....	524,317	347,850
Operation of power plants.....	785,446	397,458
Operation of cars.....	1,645,096	1,058,996
General expenses.....	549,945	449,638
Miscellaneous expenses.....	331,253	.....
<b>Total operating expenses.....</b>	<b>\$4,545,181</b>	<b>\$2,573,674</b>
<b>Net earnings.....</b>	<b>\$2,745,758</b>	<b>\$1,620,829</b>
Income from other sources.....	.....	22,519
<b>Total income.....</b>	<b>.....</b>	<b>\$1,643,348</b>
Taxes, rentals, etc.....	.....	1,464,927
<b>Net income.....</b>	<b>.....</b>	<b>\$178,421</b>

\*Including freight. †Including gas, light and water.

The operating expenses of the Connecticut company were 62.3 per cent of gross earnings, as compared with 61.4 per cent for the Rhode Island company. The Connecticut company expended 16.9 per cent of its gross earnings on maintenance and the Rhode Island company 15.9 per cent.

**Atlantic City & Suburban Traction Company, Atlantic City, N. J.**—The property of this company, which has been in the hands of a receiver for more than a year, is to be sold at auction on Oct. 31. The road extends from the Boardwalk in Atlantic City to Absecon and Somers Point.

**Buffalo & Lake Erie Traction Company, Buffalo, N. Y.**—This company has been given permission to increase its capitalization from \$5,883,000 to \$6,005,000.

**Louisville & Eastern Railroad, Louisville, Ky.**—It is reported that negotiations are under way for the purchase of the property of this company by the Louisville & Frankfort road, subject to \$650,000 first mortgage bonds, and for completion of the extension to Shelbyville. It is said that the Shelbyville extension will cost about \$1,000,000, which it is proposed to raise by the issue of about \$500,000 first mortgage bonds and about \$500,000 second mortgage bonds and preferred stock.

**Manchester (N. H.) Traction, Light & Power Company.**—It was voted at a meeting of the stockholders of this company to increase the capital stock of the company to the extent of \$400,000, to be represented by 4000 shares of the par value of \$100 each. The purpose of the increase is to cancel the floating debt and pay for the construction of the Manchester & Derry Street Railway, double tracking an additional car house at the corner of Canal and Depot Streets, and other general improvements.

**Metropolitan West Side Elevated Railway, Chicago.**—The directors have issued a statement to stockholders in which they say: "The recent depression in business not only caused a loss of business for your company, but for all common carriers, and more especially those serving large industrial centers. We feel, however, that this condition has been met and that from now on the traffic will increase, and within the near future will equal the prosperous period of 1907. We are led to believe this, as your property serves a large portion of the West side of Chicago, where the population has increased from 505,982 in 1890 to 1,300,000 in 1908; and the indications are that this growth will continue, as there still remain large areas of unimproved property easily accessible to your lines, and suitable for factories, business places and homes. As an illustration of the steady growth on the West side, there have been erected during the past year, in the territory three blocks each side of our right of way, 682 houses, containing an aggregate of 1627 flats and 29 factory buildings. Your company—owning its right of way—being well equipped with power and rolling stock, all of which has been paid for—the structure, tracks and safety devices well maintained—and with ordinance rights, of which it cannot be divested, running until 1942—feels that it is in a strong position to handle the prospective increase in traffic from the West side. Little or no complaint has been made by the company's patrons of the service offered, and we feel that your company is at this time giving the West side public a most satisfactory service. Some stockholders have expressed a fear that the rehabilitation of the West side surface lines would materially interfere with the growth of traffic. The strongest competition is with the Van Buren Street line, which parallels the Garfield Park branch, and the Milwaukee Avenue line, which parallels the Logan Square branch. These lines have been for a number of months operating large cars and giving frequent service, but so far as we can judge they have not and will not injuriously affect the traffic. The company is in better physical condition and stronger financially than ever before in its history."

**Mount Vernon Railway & Light Company, Mount Vernon, Ohio.**—A mortgage to cover a bond issue of \$100,000 has been filed by this company. The money raised by the sale of bonds will be used to pay floating indebtedness, claims and liabilities and to further equip and improve the road. The bonds run 20 years and bear 5 per cent interest.

**Norfolk & Bristol Street Railway, South Walpole, Mass.**—This company has been authorized by the Railroad Commissioners to issue \$150,000 5 per cent 20-year bonds for additional equipment.

**Springfield & Xenia Railway, Springfield, Ohio.**—A dividend of 4 per cent has been declared on the preferred stock.

**Toledo (Ohio) Railways & Light Company.**—The Toledo Railways & Light Company has made arrangements to take care of the interest on the bonds of the Toledo Gas, Electric & Heating Company, a controlled property. The interest on the bonds of the Toledo & Western Railroad is being paid.

**Twenty-eighth & Twenty-ninth Street Crosstown Railroad, New York.**—Joseph B. Mayer, New York, has been appointed temporary receiver of the Twenty-eighth & Twenty-ninth Street Crosstown Railroad by Justice Gerard in the Supreme Court. Last June the directors of the company informed the Central Trust Company that they had been informed by the Federal receivers that they would withdraw from the operation of the road and stated that they would not be in a position to pay for the operation of the line and to pay the interest on the bonds. On July 20 the Federal receivers told the Crosstown Company's directors that they had elected to cancel the agreement for the operation of the road and that its temporary operation by them was simply a matter of accommodation. The Federal receivers further told the Central Trust Company that on Sept. 30 they would wholly discontinue the operation of the line unless they received horses to the value of \$40,000, \$8,000 to pay for paving repairs, stables for horses and storage for cars. The petitioners say that they have no means of raising the funds demanded by the Federal receivers, and that unless a receiver is appointed by the State court great danger of the loss of valuable property and franchises would arise if the Federal receivers abandoned the operation of the road. They showed that during the year ended March 30 last the gross earnings from cash fares of the crosstown road amounted to \$145,236, and that the operating expenses were \$130,910, leaving the amount of the net earnings \$14,326. There was a further income of \$1,300, but the taxes paid aggregated \$12,819, leaving a net income, without providing for the interest of the bonds, of only \$2,807—a real deficit of \$72,192.

## Traffic and Transportation

### New York Receivers Deny Jurisdiction of Commission in Joint Fare Case

The hearing before the New York Public Service Commission, First District, concerning the proposed establishment of through routes and joint rates between the Metropolitan Street Railway and the Central Park, North & East River Railroad was continued on Oct. 2. George S. Coleman, counsel for the commission, made an opening statement in which he said that the only question now before the commission on this subject is what rate should be established in the territory prescribed, how that rate should be apportioned, and how the payment of the portions should be secured. He said that at the last preceding hearing counsel for the receivers of the Metropolitan Street Railway had suggested that the company would like to be heard on the merits of the entire question.

Mr. Coleman placed in evidence the order of the commission concerning the hearing under way. This order provided that the hearing should be held for the purpose of inquiring whether the joint fare should be 5 cents per passenger, or if such joint fare should be unjust or unreasonable, then what joint fare should be established and put in force. The points to which the commission desires to apply a joint fare are as follows:

1. From any point on the Fifty-ninth Street line of the Central Park, North & East River Railroad to any intersecting line operated by the receivers of the Metropolitan Street Railway, and north or south on such intersecting line to 116th Street or Thirty-fourth Street.

2. From any point between Thirty-fourth Street and 116th Street on any line operated by the receivers intersecting the Fifty-ninth Street line to the Fifty-ninth Street line and east or west on the said line to its terminus.

3. From any point between Thirty-fourth Street and 116th Street on any line operated by the receivers intersecting the Fifty-ninth Street line to the Fifty-ninth Street line and along said line to any other intersecting line operated by the receivers, and thence along such intersecting line in the original direction to any point between Thirty-fourth Street and 116th Street. Mr. Coleman repeated that the whole question before the commission is the rate now to be established, unless counsel for the company desire to present any questions of law why no rate whatever should be established.

John G. Milburn, of counsel for the receivers of the Metropolitan Street Railway, at the outset moved that the proceeding be dismissed on the ground that the commission is without power or authority to fix or establish a through route or joint rate on the lines named in the schedule, and on the further ground that the commission is without power or authority to establish through routes on street railway lines or joint rates over such through routes, or to apportion any such joint rate between the companies owning the lines constituting the through route.

William R. Willcox, chairman of the commission, denied the motion. Mr. Milburn said he would take an exception. He asked whether he was right in his position that this was an independent proceeding for the sake of knowing what the record of the receivers is to be.

Mr. Coleman said that personally he regarded the hearing as one of grace and not of statutory requirement, within the power but not within the necessary duty of the commission. Mr. Milburn said that he objected to the consideration of any evidence by the commission in the determination of this question under the order of hearing that was not introduced in this proceeding. He did not know how there could be a record in this proceeding if both sides are at liberty to use or comment upon the evidence taken in other proceedings, either that were hearings or were not hearings.

After further discussion, Mr. Milburn said he wanted to have it understood that he did not acquiesce in the position stated by Mr. Coleman, that the only question is what the through route or joint fare should be or how such joint fare should be divided.

Mr. Coleman said it was not to be supposed that the commission would act arbitrarily, and of course it was not to be assumed that any corporation or any individual would be deprived of its rights. He said that his position would be that any testimony brought out during the course of the hearings on this general subject could be placed in the record. Mr. Milburn said he would like to have every question avoided except those that go to the root of the matter; one was the power of the commission, and the other is: Is any action that it takes reasonably protective of the rights of the parties or an invasion of the rights of the parties?

Mr. Milburn then made a statement concerning the attitude of the receivers, of which the following is an abstract: "Now the underlying question is on what principle a street railway fare is fixed. That is a pretty thorny subject. It is a thorny subject so far as steam railways are concerned where the conditions are entirely different, because there you can take into account the length of the haul; the matters of cost and expense which vary with the length of haul; and the different grades of freight and many other matters affecting different localities. Those conditions of the problem are lacking from the problem of a street railway fare. The statute has fixed as a maximum a 5-cent fare for street railways. There are various situations that are conceivable; one is that you should have zones. That would seem to be the most logical solution of the problem of street railway fares; but, as everyone can see, it is impractical. As an idea it was abandoned and it developed in practice that an arbitrary fare of 5 cents, for every passenger who rode, no matter for what distance, should be charged. By practice that became the established order of things.

"I suppose the 5-cent fare had its origin on account of the nickel. The only test that you have as to whether it is under-productive or over-productive is the result of operation of the system. If a 5-cent fare was vastly more than enough to pay operating expenses, fixed charges, interest on the value of the property, or capital invested, then it would be demonstrated that that fare was too high. If, on the other hand, it was not sufficiently productive, then it is a losing enterprise because the statute fixed the 5-cent fare as a maximum, and any corporation which has accepted its charter under the general railroad law, or is incorporated under that law, is bound by that provision just as it is bound by any provisions of the franchise, regardless of whether it makes a railroad a paying one or not.

"So you are not in the region of logic; you are in the region of practical conditions, which have resulted in the establishment of a uniform fare, utterly regardless of the service rendered. That practice carried out requires, I submit, that everybody who rides on the street railway shall pay a fare of 5 cents. As soon as you begin to encroach on that principle you have destroyed the whole basis on which the statutory regulation was based.

"Therefore, I say, where you have separate lines you have to take each line by itself. Every line owned by an independent company is entitled under the application of that principle to 5 cents for a ride, from the time the man gets on to the time he gets off. In addition to this the preservation of that principle is necessary for the preservation of the property.

"The short fares have to pay for the long fares; the long distance people are carried at a loss that is made up by the short distance people who are carried at a gain, and I say that in the experience of all railroads you have to preserve your short distance profit to overbalance your long distance loss and make your return on your property. Now, I say that principle applies to whatever conditions require you to leave a road and go back to it. A device was worked out through consolidations and leases, making great systems, for having that fare operate over the entire system, so far as continuous passages were concerned, through the medium of transfers. That was an intelligent operation. Only experience could demonstrate whether it was possible or not, and the proposition which we have to submit to you is, that experience has demonstrated that it does not pay and will not pay, that only a restricted and very reasonable transfer right is consistent with the proper productivity of the property, if you maintain your uniform fare of 5 cents for all distances.

"The result of that system was that it had to be abandoned; that is, these lines, artificially brought together, belonging to different companies, but brought together for the purpose of making through lines through the medium of transfers, could not continue to exist with the preservation of the properties, and so, as might lawfully be done under such conditions, the receivers were authorized by the court not to assume the burden of an onerous lease. There were two reasons for doing it, one was to lift the load from the shoulders of the system, the other was to get rid of having to transfer. The onerous condition of things continued would keep these properties down where they are non-paying. The question is, shall that action be done away with by constructively treating these several lines as continuous and giving a single fare to be divided between the two, restoring in whole or in part the condition of things from which escape had to be found.

"We stand on the entire principle which underlies street railway fares, as I have tried to define it, and that is that for every time you get on a car of a railway company anew you pay a fare of 5 cents. The moment you begin to infringe on the principle which underlies the uniform 5-cent fare you are leading, in my judgment, to a condition of

things which, instead of giving us a good street railway, will give us a street railway system with a cord around its neck."

The hearing was continued until Oct. 7.

### Subjects of Complaints in New York

The following letter has been sent by William R. Willcox, chairman of the Public Service Commission for the First District, to all operating street railroad companies in Greater New York:

"With the close of the summer season, the commission finds it necessary to emphasize certain matters requiring special efforts to secure improvements. First, however, it is important to call your attention to the fact that the files of the commission show that a great many complaints are filed alleging inadequacy or inattention on the part of the companies.

"Thereupon it becomes necessary for the commission, under the act, to institute proceedings which require not merely the time of inspectors and officers of the commission, but also to too great an extent the attendance at hearings before the commission of important operating officials of the companies, who should be devoting all their available time to the problems of the public service required of their companies.

"The commission will not and cannot refrain under the law from instituting such proceedings if complaints are made by aggrieved parties; consequently reduction in the number of proceedings can only come from a reduction of the causes of complaint. It therefore urges that such increased care be given to the operation of your lines as will afford the best service to the public with as little unnecessary friction or inconvenience as possible. Frequently the lack of courtesy or of attention to rules on the part of employees causes irritation that is wholly unnecessary to a class of patrons.

"In accordance with the above suggestions, the commission therefore asks your immediate attention to such matters as:

"1. Inadequate service during non-rush hours, particularly theater hours and church hours on Sunday.

"2. Too protracted operation of open cars.

"3. Irregular headways of cars or trains.

"4. Unnecessary transferring of passengers to 'car ahead' or 'car behind' because of irregular headways or for no sufficient operating reason.

"5. Lack of proper heat in cars.

"6. Insufficient ventilation, arising in part and in some cases from attempting to keep up the heat in cars by the presence of passengers.

"7. Inadequate light in cars.

"8. Lack of shelter on station platforms and at transfer points.

"9. Smoking and spitting in stations and cars.

"These were during last fall and winter prolific sources of complaints. They are believed by the commission to be so capable of improvement by action of the companies themselves without orders from the commission as to produce a noticeable change of public opinion.

"While calling attention to these specific causes of frequent complaints, the commission refers you to the provisions of the Public Service Commissions law, requiring the furnishing of adequate service and to the utmost importance of running during the rush-hour periods of cars and trains to the maximum physical capacity of the lines."

**Rochester Lines to Increase Fares.**—The Rochester & Sodus Bay Railway and the Rochester & Eastern Rapid Railway will increase their fares on interurban lines on Oct. 24.

**Freight Franchise Granted in Leominster, Mass.**—The Selectmen of Leominster, Mass., have granted the Worcester Consolidated Street Railway a franchise to do freight and express business on its line in Leominster.

**Air Brakes Ordered on Yonkers Railroad.**—The New York Public Service Commission, Second District, announces that it has ordered Leslie Sutherland, receiver of the Yonkers (N. Y.) Railroad, to forthwith begin the work of placing air brakes on all passenger cars operating on that line.

**Fares Advanced in Claremont, N. H.**—The Claremont (N. H.) Railway & Lighting Company, effective on Oct. 5, increased its cash fare from 5 cents to 6 cents. A fare of 10 cents, formerly operative at 11 o'clock at night, is now effective beginning at 9 a.m. Tickets good for 100 rides are sold at \$5.50 instead of \$4.50 as heretofore.

**Iola School Board Discontinues Paying Students' Fares.**—The Board of Education of Iola, Kan., has decided to discontinue paying car fare for students living in Melrose and

other points on the line of the Iola Electric Railway who attend the Iola schools. An agreement between the city and the company in relation to these fares has been in force for two years.

**Express Trains Between Hartford, Conn., and Springfield, Mass.**—The Hartford & Springfield Street Railway will begin to operate express cars between Springfield, Mass., and Hartford, Conn., on Oct. 11. The change will lessen the running time between the two cities 25 minutes. The running time between the cities, a distance of 26 miles, will be 1 hour and 50 minutes.

**Public Service Commission Orders Platforms Vestibuled.**—The New York Public Service Commission, Second District, has ordered that on Jan. 1 all passenger cars operated on the Yonkers Railroad, New York & Stamford Railway, Westchester Electric Railroad and the Tarrytown, White Plains & Mamaroneck Railway shall have the platforms completely vestibuled.

**Receipts for Change in Milwaukee When Large Bills Are Tendered for Fare.**—John I. Beggs, president of the Milwaukee Electric Railway & Light Company, has issued an order to the effect that whenever a conductor has reason to believe he is offered a large bill with the hope that he will let the passenger ride free rather than change the bill he is to take the bill and give an order on the cashier of the company for the change.

**New Tickets Under Consideration in Philadelphia.**—John B. Parsons, president of the Philadelphia Rapid Transit Company, has announced that new forms of tickets, of which six are sold for 25 cents, are under consideration. The form of ticket under consideration has printed on one end the conditions, four in number. These say that the ticket is good for only one fare at a time, is not transferable, must be detached by the conductor and that the coupons must be used in their numerical order.

**Important Express Decision in Massachusetts.**—The Massachusetts Railroad Commission has decided that the charges of the American and National Express companies in the Boston district are unreasonable and excessive, following an investigation of the business at the instance of the Boston Merchants' Association. No trolley express service is at issue in this case. The board holds that the voluntary continuance of a given rate for a long time by a carrier, while not conclusive, creates a presumption that the rate is reasonable. The gross interstate business of the two companies is constantly increasing; the business within 50 miles of Boston is performed in a field of dense population and extremely heavy traffic, serving a population of about 3,000,000. The investment required to handle this business is relatively small, not exceeding \$600,000. The risk is also small. The net income was somewhat reduced during the business depression, but no material advance in rates has been made by other local or national carriers handling traffic in this territory. There is little evidence that the interstate business shares an undue proportion of the operating expense; whereas the net income of these carriers is increased about \$80,000 by the advance in rates of Feb. 10. The respondents' efforts to reach the cost of doing business by expert opinions based on a theory of percentages affords little real insight into the question, according to the board's decision, the theory being, in the language of the order, "fallacious and unconvincing."

**Westfield Fare Case Heard.**—A hearing upon the fares of the Western Massachusetts Street Railway in Westfield was held before the Massachusetts Railroad Commission on Sept. 30. The issue was the reasonableness of the fares charged upon the Holyoke line, the Selectmen having asked that the present rate of 10 cents from Park Square to points beyond St. Mary's Cemetery be reduced to 5 cents. At present a 10-cent fare is charged from points in Westfield to Pequot Park, located on the Holyoke line near the town boundary between Westfield and Holyoke. Attorney Morrissey, for the town of Westfield, and Representative Parker, of the same place, testified in favor of reducing the fares in order to provide cheaper rates to the park, and Bentley W. Warren, of Boston, appeared for the company. Mr. Warren stated that the company is willing to make any reasonable adjustment of specific fares and transfers in the town that will not destroy a proper revenue. He urged that if the fares were cut in two on the Holyoke line the loss in revenue would be about \$14,700, exclusive of some possible increase in returns from the lowered rate through new traffic. The latter would certainly be too small to offset the loss. Mr. Warren suggested that a restriction of the present transfer privileges in Westfield might help the earnings enough so that the fare on the Holyoke line could be reduced as desired by the petitioners, particularly as the present transfer situation is illogical and extravagantly developed. The board took the case under advisement.

## Personal Mention

**Mr. J. H. Anderson**, New York, has been elected secretary and treasurer of the Butte (Mont.) Electric Railway.

**Mr. H. P. Roeper** has been elected vice-president of the Allentown & Reading Traction Company to succeed Mr. S. H. Hoffman.

**Mr. S. E. Travis** has been elected president of the Hattiesburg (Miss.) Traction Company, to succeed Mr. A. F. Thomasson.

**Mr. George A. Barr** has been elected treasurer of the Omaha & Nebraska Central Railway, Omaha, Neb., to succeed Mr. E. R. Long.

**Mr. J. E. Lundstrom** has been elected vice-president of the Durango Railway & Realty Company, Durango, Col., to succeed Mr. J. B. Hopper.

**Mr. Z. De Graw** has been appointed chief engineer of the Easton & Washington Traction Company, Easton, Pa., to succeed Mr. Chas. M. Brady.

**Mr. A. A. Lightfoot** has been appointed superintendent of the Elgin & Belvidere Electric Company, Chicago, Ill., to succeed Mr. Geo. J. A. Doane.

**Mr. Solomon H. Hoffman** has been elected secretary of the Allentown & Reading Traction Company, Allentown, Pa., to succeed Mr. A. R. Beers.

**Mr. W. B. Moonman** has been elected secretary, treasurer and general manager of the Vicksburg (Miss.) Railway & Light Company, Vicksburg, Miss.

**Mr. W. W. Foster** has been appointed acting treasurer of the Syracuse & South Bay Electric Railroad, Syracuse, N. Y., to succeed Mr. A. K. Hiscock.

**Mr. W. W. Watson** has been elected president of the Pottstown & Reading Street Railway to succeed Mr. J. H. McNeil, who has been elected vice-president of the company.

**Mr. L. N. Loomis** has been elected president and general manager of the Twin City & Lake Superior Railway, Minneapolis, Minn., to succeed Mr. E. W. Farnham, resigned.

**Mr. T. P. Artaud** has been made assistant to the vice-president of the Hudson & Manhattan Railroad, New York. He will also fill the office of purchasing agent for the company.

**Mr. W. E. Guthrie** has been appointed superintendent, purchasing agent and electrical engineer of the Owosso & Corunna Electric Company, Owosso, Mich., to succeed Mr. Robert I. Gale.

**Mr. T. W. Shelton**, formerly general superintendent of the Fort Wayne & Springfield Railway, Decatur, Ind., has been appointed superintendent of motive power of the Peoria Railway, Peoria, Ill.

**Mr. John W. Ogden**, who is at present secretary and superintendent of the Concord, Maynard & Hudson Street Railway, Maynard, Mass., has also been elected treasurer of the company to succeed Mr. Henry Tower.

**Mr. E. C. Zehme**, editor-in-chief of the *Elektrotechnische Zeitschrift*, the leading electrical paper of Germany, has been making a tour of this country inspecting electrical developments here. He returned to Berlin Sept. 29.

**Mr. C. J. Weatherwax** has resigned his position as general passenger agent of the Schenectady (N. Y.) Railway. The position will not be filled and the work of this department will be consolidated with that of the traffic department.

**Mr. J. H. Pardee**, operating manager of the public utility properties of J. G. White & Company and secretary of the Street Railway Association of the State of New York, has been elected a director of the Buffalo, Lockport & Rochester Railway Company.

**Mr. A. H. Church**, formerly master mechanic of the Helena Light & Railway Company, Helena, Mont., has been appointed superintendent of the company to succeed Mr. T. Kelkoin, and Mr. G. E. Slusher has been appointed master mechanic to succeed Mr. Church.

**Mr. J. M. Gibson** has resigned as president and director of the Dominion Power & Transportation Company, Ltd., Hamilton, Ont., and has been succeeded by Mr. J. R. Moodie, formerly treasurer of the company. Mr. James Dixon and Mr. George B. Blanchard have been appointed vice-presidents. Mr. William C. Hawkins has been appointed secretary and general manager, and Mr. John Knox, treasurer.

**Mr. William Hooper** has resigned as treasurer of the Boston (Mass.) Elevated Railway and Mr. Henry L. Wilson, now comptroller, has been elected to fill the vacancy. Mr. Hooper has been treasurer since the formation of the company 11 years ago, and resigns for personal reasons to retire to private life. Mr. Wilson, the new treasurer, has

been with the property for 20 years as chief clerk, auditor and comptroller, and has been auditor or comptroller since 1892. Mr. J. H. Neal, now auditor of disbursements, will become general auditor, a new office. Mr. John T. Dwyer, now auditor of receipts, will become auditor of disbursements.

**Mr. C. V. Wood**, heretofore general freight and passenger agent of the New England Investment & Security Company, of Springfield, Mass., which operates the electric railways in Massachusetts controlled by the New York, New Haven & Hartford Railroad, has been appointed traffic manager, reporting to Mr. L. S. Storrs. Mr. Wood was formerly superintendent of the Pittsburg and Cleveland divisions of the Wheeling & Lake Erie Railroad, the Wabash-Pittsburg Terminal Railway and the West Side Belt Railway at Canton. Mr. Wood's steam railroad experience, however, dates from his connection in 1881 as telegraph operator with the Grand Trunk Railway, of Canada.

**Mr. S. S. Bush**, who was recently appointed general manager of the DeKalb-Syracuse & Interurban Traction Company, DeKalb, Ill., to succeed Mr. D. Thomson, is also general manager of the Pascagoula Street Railway & Power Company, Scranton, Miss., whose railway system he built in 1903 and has managed since that time. In the early part of 1906, Mr. Bush was instrumental in the purchase of the Jackson & Suburban Street Railroad, Jackson, Tenn., which was reorganized as the Jackson Railway & Light Company. This property was entirely rebuilt and is now under the management of Mr. Bush. In the latter part of 1906 he likewise was instrumental in the purchase of the City Electric Railway, Rome, Ga., of which he is vice-president and general manager. Mr. Bush is also general manager of the Flemingsburg & Southeastern Railroad, a steam line operating between Johnson and Hillsboro, a distance of 17 miles.

**Mr. C. S. Banghart**, master mechanic of the New York & Queens County Railway, Long Island City, N. Y., has been appointed superintendent of the company and hereafter will perform the duties of both offices. Mr. Banghart has been connected with railway work for about 17 years. His first position was with the line department of the Allentown & Bethlehem Traction Company. After leaving this company he became connected with the Thomson-Houston Company in the electrification of the Union Railway, New York, and at the completion of this work entered the service of the M. A. Greene Engine Company, Altoona, Pa., with which he remained about 18 months. Mr. Banghart then accepted the position of chief electrician with the Flushing & College Point Railway & Lighting Company, in which he remained until he was appointed master mechanic of the Union Traction Company, Reading, Pa., with which he was connected from 1895 to 1903. In the latter year he accepted the position of master mechanic of the New York & Queens County Railway, of Long Island City.

**Mr. E. M. Van Frank**, whose appointment as president of the Petaluma & Santa Rosa Railway, Petaluma, Cal., was noted in the *ELECTRIC RAILWAY JOURNAL* for Sept. 29, began his railroad career in 1882, at the age of 16, when he joined the engineering corps of the Pittsburg, Cincinnati, Chicago & St. Louis Railway at Richmond, Ind. The following year Mr. Van Frank entered the employ of the New York & New England Railroad, Hartford, Conn., as clerk in the office of Mr. Elliott Holbrook, division superintendent. He occupied this position until the spring of 1886, when he resigned to become chief clerk for the chief engineer of the Louisville, Evansville & St. Louis Railroad, Huntingburg, Ind., which position he held the remainder of the year. In January, 1887, Mr. Van Frank entered the electrical field with the Hutchinson (Kan.) Water, Light & Telephone Company, resigning in 1889 to become connected with the Edison General Electric Company, San Francisco, Cal. He remained with this company and its successor, the General Electric Company, until 1895 as foreman of construction. During that year Mr. Van Frank had charge of the construction and equipment of the Sutro Railroad in San Francisco, holding the position of superintendent after its completion. Until 1896 he also acted as division superintendent and superintendent of the traffic bureau of the United Railroads, San Francisco; in March of that year he was appointed general superintendent of the Petaluma & Santa Rosa Railway. A few months later he was appointed general manager and on Oct. 1 was also made president of the company.

#### OBITUARY

**John W. Nute**, of St. Louis, president of the St. Louis Car Wheel Company and also connected with other manufacturing concerns, died at his summer home near Portland, Maine, on Oct. 5, aged 47 years. He had been ill for about five weeks with gastritis. Mr. Nute was an authority on the subject of iron and the scientific manufacture of car wheels.

## Construction News

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

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

#### FRANCHISES

**\*Jacksonville, Fla.**—The County Commissioners have granted a franchise to John N. C. Stockton, president of the Ortega Land Company, for an electric railway from Jacksonville to Ortega, 5 miles. It is said that the track has been constructed, but the overhead work is not yet built.

**Eldora, Ia.**—On Sept. 8 special elections were held in the towns of Hubbard, Radcliffe and Story City, Ia., the result of which was to grant to the Iowa Railroad a 5 per cent tax on all of the property in those three towns and a 25-year franchise granting free use of all of the streets and alleys in each town on which the Iowa Railroad may, at any time, desire to lay its tracks.

**Detroit, Mich.**—The St. Clair Heights Council has passed an ordinance giving the Detroit United Railway the right to replace the single track from the Detroit city limits to the loop in that village with a double track.

**Phelps, N. Y.**—The Board of Trustees has granted the Geneva, Phelps & Newark Electric Railway another year's extension of the franchise which expired this month. [E. R. J., Sept. 12, '08.]

**Seaside, Ore.**—The City Council has granted a franchise to the Oregon Coast Railway for a street car system. Under the terms of the franchise, the grantee must make a deposit of \$500 to be forfeited in case construction work is not begun within one year, and the road is not completed within two years. [E. R. J., Sept. 26, '08.]

**\*El Paso, Tex.**—An application has been made to the Board of County Commissioners by Richard Caples for a franchise to construct an interurban railway from El Paso to Fabens.

**Seattle, Wash.**—The Seattle Electric Company has asked the Board of County Commissioners that a franchise be given on the right of way of the new county road that is being constructed northeast from the city limits to the Snohomish county line.

**Martinsburg, W. Va.**—J. C. Anderson and R. M. Johnson, of Norfolk, Va., have, it is reported, applied for an electric railway franchise in Martinsburg for the Berkeley Traction Company, which is expected to build an interurban line from Shepherdstown, via Martinsburg, to Winchester, Va.

#### RECENT INCORPORATIONS

**Cairo & St. Louis Railway, Cairo, Ill.**—This company has been incorporated in Illinois to construct an interurban line from Cairo, through the counties of Alexander, Union, Jackson, Randolph, Monroe and St. Clair to East St. Louis. Capital stock, \$100,000. Headquarters, Cairo, Ill. Incorporators and first board of directors are: William B. McKinley, George M. Mattis, W. H. Carnahan and George W. Burton, all of Champaign, and L. E. Fischer, of Danville.

**Nebraska Traction & Power Company, Omaha, Neb.**—Incorporated at Lincoln to build an electric railway from South Omaha to Ralston, 6 miles. The company is said to have already ordered material and is ready to go on with the grading of the road. A power station will be built at Ralston. Capital stock, \$2,000,000. Incorporators: Mel Uhl, J. F. Emmert, W. D. Crist, N. P. Dodge, Jr., and F. N. Howard. [E. R. J., Aug. 29, '08.]

**\*Dayton, Springfield & Xenia Southern Railway, Dayton, Ohio.**—This company has been incorporated by W. S. McComaghey and others to build an electric railway from Xenia to Wilmington and later to Cincinnati. Capital stock, \$10,000.

**\*Dayton & Western Railway, Rapid City, S. D.**—Incorporated to construct a line from Rapid City to Hill City, a distance of 20 miles, with a provision for an extension into Wyoming. Capital stock, \$100,000. Incorporators: A. M. Lanphere, W. H. Lanphere, T. A. Mair, Knute Kleven, J. W. Cook, all of Rapid City.

**\*Cheat River Electric Railway, Morgantown, W. Va.**—An application has been filed with the Secretary of State for the incorporation of this company, which proposes to build an electric railway up Decker's Creek by way of Dellslow to Cheat River. This part of the work is expected to begin at once. Eventually the road will be extended to Point Marion where it will connect with an electric road to be built from Fairchance. J. H. McDermott

and H. R. Warfield are two of the principal organizers of the new company.

#### TRACK AND ROADWAY

**Los Angeles (Cal.) Railway.**—This company expects to add one mile of new track to its lines in Los Angeles and will also construct three reinforced concrete bridges. Contracts for this work are to be awarded within five months.

**Parkside Transit Company, San Francisco, Cal.**—This company has let contracts for the completion of its entire railway system on Twentieth Avenue, T Street, Thirty-fifth Avenue, and the Sloat Boulevard to Ingleside to Chadwick & Sykes, Crocker Building, for \$200,000. The railway will be double-tracked throughout, with terminals at the beach and at Ingleside. For the present it will connect with the United Railroads at H Street, but later the cars will run downtown. [E. R. J., Oct. 3, '08.]

**\*Stockton Terminal & Eastern Railroad, Stockton, Cal.**—This company is reported to have been formed for the purpose of constructing a line from Stockton east through Waterloo, Linden and Belota to Jenny Lind, a distance of about 27 miles. For the purpose of financing the road, a company known as the United Investment Company has recently been incorporated in Arizona, with offices in San Francisco, and a capital stock of \$750,000. Officers: R. N. Griffith, president; H. M. Saunders, vice-president; A. C. Stelter, secretary-treasurer, and J. E. Adams, manager. W. H. Newell, Stockton, advisory engineer. It is the intention of the promoters to operate gasoline motor cars.

**\*San Mateo Beach Railway, San Mateo, Cal.**—Henry Hagen writes that he expects to start work on the proposed electric railway from San Mateo to San Mateo Beach before Jan. 1, 1909. The line will also extend to the Casino at San Mateo Beach.

**Stockton, Cal.**—It is stated that Morris L. Brackett, of New York, has financed the proposed standard gage electric railway, which is to extend from Stockton to Modesto. The rights of way have all been secured and turned over by the promoters free of charge to the capitalists, and a contract or agreement has been entered into between the South San Joaquin Improvement Company, which is promoting the line, and Mr. Brackett, by the terms of which he guarantees to go ahead and construct the road. Engineers and surveyors will be put into the field at once. The road will go out Lincoln Street in a generally southeasterly direction to Modesto, touching French Camp, Summer Home, Manteca, Ripon, Salida, the Woods colony and Modesto. The road will be 33 miles in length and run chiefly on section lines, through a 100-ft. right of way. It will be known as the San Joaquin Valley Electric Railway. It is estimated that it will cost \$600,000 to build and equip the line.

**California Midland Railroad, San Francisco, Cal.**—F. E. Fitzpatrick, of this company, during a recent conference with Charles A. Trow, chief engineer, is said to have announced that construction work on the railroad will be resumed within a few weeks and will be in full swing by Jan. 1. Occupants of the right of way at Auburn have been notified to vacate. The road will connect Marysville, Grass Valley, Nevada City and Auburn.

**\*Boulder, Col.**—It is reported that James A. Murray, of Butte, Mont., has purchased an interest in the Boulder Hot Springs and is planning to build an electric railway from the hotel to the Great Northern road.

**\*Greeley, Col.**—At a meeting recently held among business men of Greeley the Denver & Interurban Construction Company, through its officers, presented its plans for building a line from Denver to Greeley. The officers stated that the company now owns all of its private right of way, paralleling the Union Pacific, between Greeley and Denver and following the county wagon road. The plan is to build the road to a point 3 miles north of Platteville, and from there run lines eastward into the Big Bend country and north to Greeley.

**\*Clarksville, Ga.**—E. S. Hunnicutt, of Clarksville, writes that he is planning to construct a street railway, 1½ miles long, from the depot to the business section of the town. Gasoline motor cars are to be operated for the present. Mr. Hunnicutt states that the cost of the proposed line will be about \$8,000, equipped.

**Elgin, Woodstock & Lake Geneva Railroad, Elgin, Ill.**—A contract for grading along the route of this proposed electric railway line has been awarded the George H. Painter Company, of Chicago, and work will be started immediately. It is the plan of the company to build a line, which is to extend from Elgin to Woodstock and Lake Geneva. J. A. Kirkland, Elgin, Ill., is interested in this project. [S. R. J., April 18, '08.]

**Evansville & Southern Indiana Traction Company, Evansville, Ind.**—This company on Oct. 1 entered upon the

work of surveying a new extension of its line between Patoka and Hazleton.

**Evansville & Eastern Railway, Evansville, Ind.**—This company is pushing the construction of its line between Evansville and Newport. The large fills have been completed and the most of the grading done. About 7 miles of track has been laid and the object is to complete the line by Nov. 10.

**Terre Haute, Indianapolis & Eastern Traction Company, Richmond, Ind.**—This company has just awarded a contract to the American Concrete Company, Richmond, Ind., for a section of street in Richmond on the company's lines for the purpose of testing concrete to determine its value for use in electric railway work.

**Sioux City & Spirit Lake Railway, Hartley, Ia.**—This company has closed a contract with Westinghouse, Church, Kerr & Company, New York, for the construction of the road from Sioux City to Spirit Lake. It is said that the engineers of the constructing company will be in Sioux City in a few days and the surveys will be completed in a short time. The officers of the Sioux City & Spirit Lake Railway are: Frank Patch, president; George Coleman, secretary; G. E. Knaak, treasurer; E. A. Burgess, chief counsel; L. A. Wakefield, chief engineer; J. D. Browning, general manager. Directors: W. W. Artherholt, Frank Patch, H. A. Miller, L. E. Francis, George Coleman, G. E. Knaak, W. H. Beck, M. L. Flinn, F. L. Eaton, George Ward and D. A. Fletcher. [S. R. J., Nov. 2, '07.]

**Alexandria (La.) Electric Railways.**—It is stated that this company will build a 2-mile extension to the Kent Land Company's addition.

**Boston & Northern Street Railway, Boston, Mass.**—This company has asked the approval of the Railroad Commission for a track location in Cabot Street, Beverly, Mass., 90-lb. girder rails to be the minimum size used.

**Boston (Mass.) Elevated Railway.**—This company has requested the Massachusetts Railroad Commission to approve the route of its proposed extension of elevated structures from Sullivan Square, Charlestown, to Malden and Everett. Petitions asking the approval of this route were filed with the Aldermen of Boston, Malden and Everett on July 10, but were not approved by the local authorities. The commission will decide the location after due hearings. The proposed route would connect the present elevated structure at Sullivan Square with a line running northeasterly across the Mystic River parallel to Broadway, and thence turning to the north at the Revere Beach Parkway near Everett station, and terminating near Malden Square. The length of the line is about 3 miles. The company, the Boston & Maine and the Boston & Albany steam railroads have also petitioned the commission for the reconstruction of the Mystic Avenue bridge over the tracks at the Somerville-Charlestown boundary. The bridge will probably be used by semi-convertible cars to be run from Sullivan Square through the Middlesex Falls Parkway.

**Pittsfield (Mass.) Street Railway.**—It is stated that Barnes & Spaulding have started the survey for the company for the proposed extension of its line from West Pittsfield to the State line.

**Springfield (Mass.) Street Railway.**—This company has requested the approval of the Massachusetts Railroad Commission for a relocation of tracks on Main Street, Springfield, from Liberty Street to Bliss Street. The new tracks are to be 9 ft. 6½ in. apart on centers. The work is to be finished by Jan. 1.

**Worcester, Mass.**—The Worcester & Southbridge and the Hartford & Worcester Street Railway companies have petitioned the Massachusetts Railroad Commission to approve an extension of their operating contract for one year, beginning Oct. 1, 1908.

**Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine.**—This company is said to have petitioned the Board of Railroad Commissioners for approval to change the location of its line between Augusta and the town of Vassalboro, on that leading from the corner of Cony Street in Augusta to the east end of the Ticonic bridge in the town of Winslow.

**Hattiesburg (Miss.) Traction Company.**—S. E. Travis, president of this company, is reported to have announced that construction work would be resumed on the local street railway by Dec. 1. Fred F. Ames and John D. Curtis, operating with Guy M. Walker, New York, are said to be interested in the bonds. The company has about 5 miles of tracks already laid. It is also the intention of the company to erect a new power station.

**Kansas City & Bonner Springs Railway, Kansas City, Mo.**—It is reported that work on this line will begin in a few days, when workmen will commence laying track from

Forest Lake to Edwardsville, a distance of 5 miles. When this is completed grade will be made from Edwardsville the entire distance to Kansas City. John W. McDaniel, Bonner Springs, Kan., president.

**St. Louis, Monte Sano & Southern Railway, St. Louis, Mo.**—The Monte Sano Construction Company and the Hickey Bros.' Construction Company recently filed mechanics' liens against the property of the railway company, to force the payment of money they allege to be due for construction work on the new line the company is building through the southern part of St. Louis county. The Monte Sano company has a claim of \$23,899 and the other company, \$4,334. Work on the new line has been at a standstill for several weeks.

**Southwest Missouri Railroad, Webb City, Mo.**—The newly constructed line of this company between Joplin and Villa Heights has been opened for traffic. It is intended ultimately to extend the branch to a junction with the belt line at some point east of Villa Heights.

**Fries Manufacturing & Power Company, Winston-Salem, N. C.**—This company, which owns and operates the local street railway system, has just completed and placed in operation an extension of its lines to Fairview and Piedmont Park. The company now has in operation 13 miles of track and operates 27 cars.

**Dover, Somersworth & Rochester Street Railway, Dover, N. H.**—It is stated that this company has about completed grading the roadbed for its extension between Rochester and East Rochester. J. A. MacAdams is quoted as saying that he expects to have cars running over the line about Nov. 1. One hour time will be made on this line when completed.

**New York, N. Y.**—Bids will be received by J. W. Stevenson, Commissioner of Bridges, 21 Park Row, New York, on Oct. 12, 1908, for furnishing and installing the electrical equipment for the overhead trolley system of the Blackwell's Island Bridge over the East River, between the Boroughs of Manhattan and Queens.

**\*Rome, N. Y.**—It is reported that a largely attended meeting of business men was held in Rome last week to consider the project of D. C. Hadcock, of Oneida, to construct an electric railway from Rome to the Rome State Custodial Asylum.

**\*Pittsburg & East Liverpool Electric Railway, East Liverpool, Ohio.**—This company has been formed to build an electric railway from Pittsburg, Pa., to East Liverpool, Ohio, over an air line route, 34 miles. Officers: Prof. J. M. Reed, Dravosburg, president; Rev. A. Moore Buchanan, Morgantown, W. Va., secretary, and Hon. J. C. McClaren, Murdocksville, treasurer.

**\*Mangum, Okla.**—It is said that meetings of citizens of Reed and Vinson have recently been held for the purpose of making preparations toward the building of an electric railway to connect Mangum, Reed and Vinson. A committee from the three towns has been appointed to consider the project. From Mangum: T. P. Clay, D. J. Doyle and Frank Mathews. From Reed: F. J. Perrin, C. M. Pickard and Dr. Jester. From Vinson: A. P. Slusher. These committees met at once and decided to proceed with the organization of a company.

**Johnstown (Pa.) Passenger Railway.**—This company has just completed and will soon place in operation its extension to Morrellville.

**\*Lebanon, Pa.**—A meeting of local people and of Schaefferstown men interested in the proposed railway from Schaefferstown to Lebanon was recently held in Lebanon. Frank F. Houck was made chairman of the committee on survey and the procuring of a charter. It was stated that much of the right of way has been promised. The route to be covered includes Campbelltown, Bismark, thence by way of Zinn's Mill to Lebanon, then to Iona, to Schaefferstown, to Kleinfeltersville, to Newmantown, to Womelsdorf. A line from Bismarck to Cornwall, to Rexmont, and thence to the main line at Schaefferstown is also contemplated. The company will be known as the Lebanon & Southern Street Railway.

**Shamokin & Edgewood Street Railway, Shamokin, Pa.**—It is stated that all the rights of way for the extension of this company's line to Sunbury have been secured and construction work will be commenced shortly.

**Southern Cambria Railway, Johnstown, Pa.**—The Cambria Steel Company has completed the steel viaduct for the Southern Cambria Railway line, connecting the Tenth and Eleventh Wards. It is 1150 ft. long, 34 ft. wide and 40 ft. high and contains 458 tons of steel.

**Augusta & Edgefield Electric Railroad, Edgefield, S. C.**—A meeting of the incorporators of this company was held on Sept. 30. The object of the meeting was to open and

pass on bids for the survey of the line from North Augusta to Greenwood. [E. R. J., Aug. 22, '08.]

**\*Austin, Tex.**—It is reported that a syndicate of St. Louis capitalists headed by William D. Boyce, of the Boyce Construction Company, will construct an extensive electric railway system in Central Texas. It is stated by Mr. Boyce that all arrangements for financing the road have been made. It is planned to start the work on the first division of the system as soon as the final survey is finished. This division will run between Temple and Waco, by way of Marlin, and will have a length of about 50 miles. The second division will run from Temple south to Austin, a distance of about 60 miles. It is planned to erect a power plant at Temple at a cost of about \$200,000. This plant will be of ample size to afford power for the whole system, including a proposed extension from Austin to San Antonio, a further distance of about 80 miles.

**Tyler, Tex.**—The ELECTRIC RAILWAY JOURNAL is in receipt of a letter stating that this city presents an inviting field for a street railway and that correspondence is solicited with parties interested in the construction of such a line. John H. Bonner, Mayor.

**Uvalde (Tex.) Street Railway.**—A contract has been let to the Weber-Duller Construction Company, Houston, Tex., for the construction of the proposed street railway system in Uvalde. J. C. Kerbey and John T. Smith are the holders of the franchise. The road will be about 3 miles in length. Gasoline motor cars will be operated. [E. R. J., Aug. 15, '08.]

**Puget Sound Electric Railway, Tacoma, Wash.**—Announcement is made that about the middle of December the new Brookville-Puyallup branch of this company will be opened for traffic. The new line is 9 miles in length and a large part of the roadbed is already completed. Track has been laid from Sumner to Puyallup, and from the junction with the main line at Brookville to the point at which the line crosses the tracks of the Chicago, Milwaukee & St. Paul Railroad. At the point where the new line crosses the Puyallup River a steel bridge with a 200-ft. span is to be erected. All the material for the bridge is now on the ground and work on the structure has been commenced. The company expects to maintain an hourly service on the new line.

**Milwaukee Northern Railway, Cedarburg, Wis.**—According to reports from Milwaukee, this company recently opened its extension from Cedarburg, Wis., north to Sheboygan, 30 miles. Work is now under way on a northwest branch from Cedarburg, via West Bend, to Fond du Lac, which, it is expected, will be finished this year.

#### POWER HOUSES AND SUBSTATIONS

**Los Angeles (Cal.) Railway.**—The ELECTRIC RAILWAY JOURNAL is advised that this company expects soon to build and equip a new substation.

**Washington, Arlington & Falls Church Street Railway, Washington, D. C.**—A. J. Porter, of Clarendon, has been awarded the contract for the erection of a substation at Lacey station on the five-acre tract purchased by the company. It is said that work on the erection of the building will begin at once.

**Evansville & Southern Indiana Traction Company, Princeton, Ind.**—The recent drought will, it is claimed, make it necessary for this company to remove its central power station from Ft. Branch to Patoka. The company has experienced much trouble because of lack of water, frequently having to haul water to supply the boilers. The Patoka River will afford ample supply when the plant is re-established at this point.

**Interstate Railways, Philadelphia, Pa.**—It is announced that the Reading Power Company will issue \$1,500,000 first mortgage bonds, guaranteed by the United Traction Company, the proceeds of these bonds to be expended on a new power station at Reading. This power will operate the company's lines from Reading down to Chestnut Hill, as well as the Lebanon Valley.

#### SHOPS AND BUILDINGS

**New York & Queens County Railway, Long Island City, N. Y.**—This company is said to have purchased of the Degnon Realty & Terminal Improvement Company six acres on the Flushing Creek meadows, in the town of Newtown, and with a frontage of 364 ft. on the south side of Jackson Avenue. The company proposes to locate on this site a new car house and shops and power station.

**Columbus, Delaware & Marion Railway, Columbus, Ohio.**—This company has moved the general manager's office from Marion, Ohio, and the auditors' office from Delaware to the new station at Columbus, Ohio. All the offices of the company will now be located in one building.

# Manufactures & Supplies

## ROLLING STOCK

J. L. Laxton, 2352 Plover Avenue, St. Louis, Mo., wishes to correspond with manufacturers of street cars propelled by storage batteries.

Oklahoma, Kansas & Missouri Interurban Railway, with headquarters at Miami, Okla., will, it is reported, purchase gasoline motor cars for its line now building from Miami to Hattonville.

Philadelphia (Pa.) Rapid Transit Company contemplates the purchase of 100 new cars at a cost of at least \$400,000, and the conversion of 700 of the present cars into the pay-as-you-enter type at a cost of about \$500 per car.

Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., has just received three single-truck closed motor cars from the St. Louis Car Company. The cars are 32 ft. over bumpers with 5-ft. vestibules and have an 8-ft. wheel base and are painted yellow and trimmed with brown, the interior being finished with quarter-sawed oak and the ceiling is of bird's-eye maple. They are equipped with a destination sign at the top and at either end and reversible back cross seats. Two of the new cars will be used in Dixon and two in Sterling.

Houghton County Traction Company, Houghton, Mich., has ordered through the Stone & Webster Engineering Corporation, of Boston, Mass., four passenger cars. They will be built by The J. G. Brill Company, and will be 31 ft. 7 in. over corner posts and 42 ft. 9 in. over all. They will be equipped with Brill 27 GE-1 trucks and General Electric motors. Allis-Chalmers air brakes will be provided. In design, the cars are straight-sided with steam type roof. They will have Peter Smith hot-water heaters and Heywood Brothers & Wakefield Company's Walkover seats and vestibules.

## TRADE NOTES

Simmen Automatic Railway Signal Company, Los Angeles, Cal., has just closed a contract for equipping the lines of the Toronto & York Radial Railway.

Frank H. Taylor on Sept. 1 resigned his position as a vice-president of the Yale & Towne Manufacturing Company, but retains his position as a member of the Board of Directors.

Massachusetts Chemical Company, Walpole, Mass., is building an addition to its factory which will provide about 15,000 sq. ft. more of floor space, the greater part of which will be utilized by the company's tape department. The friction tapes manufactured by this company are well known to the electric trade because of their durability and adhesive and moisture-proof qualities. The new addition to the plant will enable the company to greatly increase this branch of its business.

Harry Pennington, Houston, Tex., has been appointed as Texas agent of the Wheeler Condenser & Engineering Company, Carteret, N. J. Mr. Pennington has been engaged in mechanical engineering in Houston for several years, and has been identified with many of the large enterprises in that section, having had charge during the past seven years of engineering construction work costing over \$2,500,000. He is at present consulting engineer for the Galveston Water Works, engineer for Houston and Fort Bend counties, president of the Southwestern Engineers' and Architects' clubs, and chief engineer officer of the State of Texas.

McGovern, Archer & Company, New York, have recently purchased from the Union Railway, of that city, a number of good single-truck cars, given up because the company decided to adopt a different and much longer car. Some of the cars are 28 ft. over all and others are 32 ft. over all. McGovern, Archer & Company also announce that they have a number of long, semi-convertible cars equipped with four-motor equipment and suitable for interurban service which were formerly run on the Third Avenue Railroad and are being replaced by pay-as-you-enter cars. McGovern, Archer & Company have been appointed sole selling agents for these cars.

Dossert & Company, Inc., New York, announce that they have received an order from the Central Electric Company, Chicago, Ill., for 1000 Dossert solderless lugs, ranging in size from No. 6 to 1,250,000 circ. mil, and comprising front-connected, back-connected and 60-deg. angle lugs. The order also includes about 100 Dossert solderless cable taps. Orders have also been received from the San Francisco representatives of Dossert & Company for large cable taps and lugs for use on the heavy cables of the Great Western Power Company in California, and from the Illinois Tunnel

Company for cable taps, reducers and special terminals for the wiring of the signal service in the Chicago subway.

Glidden Varnish Company, Cleveland, Ohio, has broken ground for its new two-story and basement administration building, which will be of brick with white marble trimmings, 110 ft. long by 65 ft. deep. The equipment and construction are to be most modern. The first floor will be devoted entirely to the advertising, Jap-a-lac and general sales departments of the company, telephone exchange and a dining-room where lunch will be served daily. The second floor will contain the officers' and directors' rooms, legal, credit, cost accounting, purchasing and traffic departments. On the third floor will be the rest room, library and convention hall. Lavatories and shower baths for the use of the office force, which numbers about 100 people, will be located in the basement. The building is to cost about \$90,000, and will be ready for occupancy about May 1, 1909, when the general offices will be removed to it from the Rockefeller Building.

The Falk Company, Milwaukee, Wis., will have for general distribution at the convention a beautiful souvenir pamphlet, illustrating its manufactured products. Should any visitor fail to secure this pamphlet a copy will be forwarded if desired. The hardened center track work, for which it is receiving large orders, is shown in the standard sets of girder guards, switches, mates and frogs in its steel-bound manganese insert steam-electric railroad crossing. Gears and pinions are illustrated, special attention being called to the quality of material used. To the railway men, interested in hydro-electric properties, the cut of a spiral case for a 13,000-hp turbine, weighing, approximately, 40 tons, cast by the Falk Company in its steel foundry for the Allis-Chalmers Company, will be especially attractive. The Falk Company's Pacific representatives, Wigmore Bros., Los Angeles, have received a large order from the Fresno Traction Company for high-grade hardened center manganese insert special work.

The Consolidated Car Fender Company, of Providence, R. I., reports that the tests conducted on its fender and wheel guard at the Schenectady tests of the New York Public Service Commission, of the First District, have been very successful. The Providence fender was tried on all the dummies, from 50 lb. to 170 lb. in weight, and is stated to have met every requirement, especially in the test where a projection is placed in the roadbed to see whether the fender would be forced back and tend to derail the car. The company also submitted its new automatic apron type wheel guard. This had been developed to meet the demand for a life-saving device under conditions where a projecting fender cannot be used. The wheel guard acts automatically, either through a swinging apron or by the application of air from the motorman's brake valve. The tests which the commission conducted on this guard showed that while the basket would pick up the dummies correctly, its shape was such that it would not retain them. The manufacturer, therefore, has undertaken to change the form of the basket to correspond with the fender which proved so efficient at the other tests.

Buckeye Electric Company, Cleveland, Ohio, has made a special study of street railway conditions for a number of years in an endeavor to manufacture lamps for street railway purposes that will meet the demands of the most exacting purchasers. As a result, several satisfactory types have been developed. The company's street railway series lamp is selected at all times for a very close ampere range. The filament is of the standard, oval-anchored type, with standard efficiencies of 3.5 watts per candle and 4 watts per candle, but is somewhat heavier than that in the lamp for stationary use. The company also manufactures a special direct-current, series tantalum lamp for street railway circuits. While this lamp is not recommended directly for car use, it is desirable for car houses, shops, offices, etc. It is said for this lamp that it will give 20 per cent more light with a current reduction of at least 30 per cent over the standard carbon railway series lamp. Besides the lamp mentioned the company has the latest tungsten lamps in all standard wattages and voltages, making a specialty of building these lamps for series circuits in stationary service. They are known to the trade as series burning tungsten lamps.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.—Shareholders have received letters from George Westinghouse urging them to co-operate in carrying out the modified plan for reorganization of the finances. Mr. Westinghouse points out that of the 4000 stockholders, 2200 have subscribed to the pro rata share of their holdings of the new issue of assenting stock at par, and merchandise creditors have agreed to take \$4,000,000 of assenting stock at par in satisfaction of their claims. In addition, more than



5000 of the company's employees have taken an aggregate of 12,225 shares of the new stock. With the letter Mr. Westinghouse enclosed a statement of the estimated resources and requirements of the company for the five years beginning April 1 last. The statement puts the minimum of resources in this period at \$38,000,000 and the probable resources at \$54,000,000. Requirements in case bank creditors accept 20 per cent of claims in stock are estimated at \$34,000,000; in case they take 50 per cent of claims in stock, at \$32,000,000. Each estimate of requirements includes the payment of 6 per cent dividends on the assenting stock. The business of the company under the receivers, Mr. Westinghouse says, has been efficiently managed, and the business depression has given opportunity to make changes in manufacturing methods which are expected to be of lasting benefit in future operations. The result is that the company is now in excellent condition to take advantage of the expected improvement in business. "I have subordinated my own interests," Mr. Westinghouse concludes, "in order to save a valuable property to the stockholders, and I am willing to make further sacrifices. But to effect a complete and satisfactory rehabilitation of the company requires your cordial support and prompt material assistance."

#### ADVERTISING LITERATURE

**Muralt & Company, New York,** published this month the twelfth issue of its monthly bulletin, entitled "Electric Trunk Line Age." This publication advocates the three-phase system of electric traction.

**Crane Company, Chicago.**—The September issue of the *Valve World*, which is published by this company, is up to the high standard of previous issues. The illustration on the front page was made from a photograph of the Crane flange-welding machine. The reading pages contain much information both of a news and technical value.

**Ingersoll-Rand Company, New York.**—This company is mailing a 50-page catalog devoted to small belt and gear-driven air compressors intended especially for installation in small shop plants. A number of typical applications of compressed air in machine shops, foundries and other factory departments, including air-lift pumping and air-motor hoisting, are described. Special mention is made of the class EE-1 compressors, which are built on the "straight line" principle.

**Canton Culvert Company, Canton, Ohio.**—This company has just issued a folder describing the "Acme" corrugated metal culverts which are finding wide application in roadway construction. An important feature of these culverts is their nestable construction. In setting them up the sections overlap each over one corrugation, allowing the bolt holes to match. A hammer and wrench are the only tools needed to set up culverts of this type. The culverts are made in all sizes, from 8 in. to 6 ft. diameter, of "bloom" iron heavily galvanized to prevent corrosion.

**J. G. Brill Company, Philadelphia.**—The September issue of *Brill's Magazine* contains illustrated articles describing the cars built for city and interurban service of the Washington (D. C.) Railway & Electric Company, and also the semi-convertible cars recently built for the Chambersburg, Green Castle & Waynesboro Street Railway. Other articles in this issue are "Moonlight Cars for Kansas"; "Large, Semi-Convertible Interurban Cars for the Lexington & Interurban," and "Standard Types of Wason Snow Plows." Each article is fully illustrated by half-tone engravings.

**Northwestern Expanded Metal Company, Chicago, Ill.**—This company has just issued a pamphlet containing a description of its expanded metal products. A table giving the standard sizes of fabric manufactured by the company is included, together with a standard formula used in designing reinforced concrete. The company announces the following pocket-size booklets in preparation: Expanded Metal Information; Expanded Metal Plastering Lath; Sidewalks, Beams and Columns; Floor and Roof Slabs; Slab Bridges; Arch Bridges; Sewers and Culverts; Tanks and Walls.

**Bird-Archer Company, New York.**—"Boiler Troubles and Their Prevention" is the title of a 48-page treatise just issued by this company. This book explains corrosion, scale, oil and grease deposits and what harm they may do. It tells what scale consists of, how it collects, resulting loss in fuel and steaming capacity, dangers from overheating, cost of mechanical cleaning and the advantage of proper boiler compounds in preventing such troubles. It further discusses every method of water and scale treatment, gives advice on feeding boiler compounds, the care of blow-off valves, etc.

**Egry Register Company, Dayton, Ohio.**—This company has just issued a very artistic booklet describing the Egry manifold apparatus which is applicable for train dispatching and way billing. The booklet is printed in colors and has

a full-page illustration of the Egry car dispatcher. Some valuable suggestions are made as to the best methods of train dispatching and complete descriptions of the Egry dispatcher and way billing manifold machines are given. The Egry system is designed to simplify and expedite the office work of railway companies and to aid in making electric railway operation less hazardous. The company's products have been in use on many electric railways for several years.

**General Electric Company, Schenectady, N. Y.,** has issued Bulletin No. 4616 giving a detailed description of the company's high-voltage type H transformers; Bulletin No. 4618 describing form P.B. polyphase generators for use in small power plants and isolated lighting plants where rapidly increasing inductive loads and low power factors are encountered; Bulletin No. 4619, describing the manner in which automatic regulation of a variable load can be accomplished with feeder regulators; Bulletin No. 4622, describing the company's polyphase maximum watt-demand indicators. The company has also recently issued a booklet descriptive of its "Multi-Catch Socket," which is designed to be put in wherever any standard socket can be used.

**Standard Paint Company, New York.**—This company has just issued a 32-page pamphlet which has for its subject Ruberoid roofing and also contains a full description of the company's other products, Ruberoid flooring and building, sheathing and insulating papers. In the first two chapters are presented a brief history and description of Ruberoid roofing. The pamphlet is illustrated with photographs of buildings designed for various purposes on which the company's products have been used. These include among others, Exhibition Building, Tokio, Japan; Crematory, Chemnitz, Germany; Observatory, Bourges, France, and the Thermal Bath Building at Rotorua, New Zealand. A number of testimonials from users of the company's products are also reprinted.

**Allis-Chalmers Company, Milwaukee, Wis.**—Some of the different styles of direct connected Reynolds-Corliss heavy duty engines are shown in bulletin No. 1510 issued by this company. The company claims the distinction of building the first Corliss engine for direct connection to an electric generator. This unit was put in service nearly 15 years ago, and now more than 1000 Reynolds-Corliss engines are in successful operation. Many of the first engines have been running continuously ever since installed. Among the largest engines built for direct connection are the combined horizontal and vertical compound heavy duty machines constructed by the company for the Manhattan Elevated Railway, New York, and the Interborough Rapid Transit Company, operating the subway in New York.

**Consolidated Supply Company, Chicago.**—This company is sending out its catalog No. 15, which describes and illustrates portable pipe bending machines, operated by compressed air or steam; pneumatic turn-table devices, malleable iron and cast steel derailleurs, wrecking frogs, Monarch couplers, metal car roofing, steel brushes and brooms and many other devices used by electric railways. The catalog also shows steam, belted and motor-driven air compressors made in sizes up to a capacity of 4000 cu. ft. of free air per minute. Several illustrations of the pneumatic and electric tools made by this company are also shown. Special attention is called to the Consolidated patented metal car roofing which has recently been placed on the market, and mention is made of the company's malleable iron tie plates, of which large quantities have been sold. Other special devices mentioned are Monarch couplers for engines and cars, Reading multiple-gear chain hoists and Northern fire extinguishers.

**Waddell & Mahon Corporation, New York,** has recently published a brochure illustrating its exceptional facilities for handling strikes on a large scale and describing in detail the methods employed by it when acting as special agent for large corporations in labor troubles. The business of the corporation is divided into the following departments: Labor bureau, commissary department, legal department, department of publicity, protection department, department of accounts, department of information and transportation department. At the heads of these departments are men chosen on account of their special fitness and knowledge of the work allotted to them previous to and during the existence of a strike. The list of men, both skilled and unskilled, on the permanent payroll of this company is large, but when furnishing men for strike-breaking purposes all applicants are subjected to a severe examination, and only those are employed who can show that they are competent to do the work before them. The commissary and protection departments are closely allied, and are organized with particular attention to the comfort of the men when off duty and their protection during service. The transportation department of the company makes all arrangements with railroads for special trains, and is prepared to ship men

to any part of the country at a few hours' notice. In coping with labor troubles, the legal and publicity departments render valuable service, injunctions being secured wherever practicable and advisable. The company's side of the controversy is frequently clearly and distinctly stated in advertisements in the local press and public sentiment turned in favor of the company, a most effective method of curbing lawlessness and ending a strike. Waddell & Mahon Corporation has successfully handled a number of large strikes, notably that on the Interborough Rapid Transit Company's system in New York in 1905, and the street railway strike in Birmingham, Ala., in May, 1907.

### ELECTRIC RAILWAY PATENTS

UNITED STATES PATENTS ISSUED SEPTEMBER 29, 1908.

[This department is conducted by Rosenbaum & Stockridge, patent attorneys, 41 Park Row, New York.]

**Track Sanding Machine**, 899,529; T. L. Hamer, of Newark, N. Y. App. filed Dec. 28, 1907. A hand truck carrying a sand hopper over each rail, the escape valves being controlled by the operator as the truck is pushed along the track.

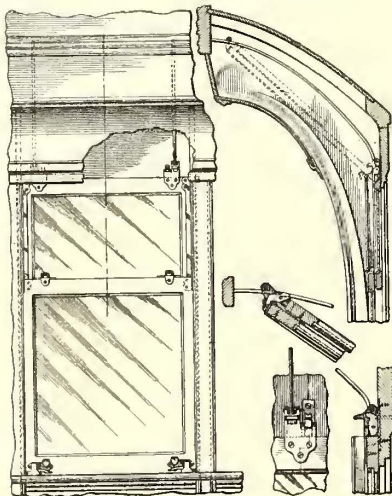
**Trolley-pole Catcher**, 899,578; John H. Walker, of Lexington, Ky. App. filed Dec. 26, 1907. The trolley pole is held elevated by a pair of links connected thereto of such a character as to actuate certain releasing pawls and permit the pole to drop in case of sudden upward movement.

**Automatic Third-rail Contact-shoe Guard**, 899,593; William E. Hayes, of Frankfort, N. Y. App. filed Jan. 22, 1908. A movable protecting insulator for the contact shoe of third rails and means arranged in advance of the shoe and acting on the third rail to move the insulator aside as the rail is approached.

**Solenoid Motor**, 899,598; Lemuel Frederic Howard, of Edgewood Park, Pa. App. filed Oct. 23, 1906. The solenoid motor has two cores, one with a conical recess, and the other with a conical projection, which are attracted together to elevate a semaphore blade.

**Rotary Snow-plow**, 899,606; John Fremont Murphy, of Paterson, N. J. App. filed July 11, 1908. Details of construction.

**Rail Joint**, 899,647; Daniel C. Armstrong and William P. Fitzgerald, of Princess Anne, Md. App. filed Jan. 22, 1908. Has co-acting wedge-shaped keys disposed beneath the rails at the meeting ends thereof, and so arranged as to elevate the rails should the latter sag or become depressed at the joint from excessive wear or other causes.



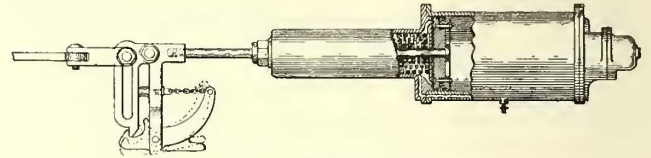
Railway Car, Pat. No. 899,763

**Rail Joint**, 899,655; Commodore Perry Brown, of Roncoverte, W. Va. App. filed Sept. 12, 1907. Comprises a pair of fish-plates, clamping yokes arranged opposite each other and engaging the fish-plates, a link for each pair of yokes passing under the fish-plates through slots in the lower arms of the yokes, and pins passing through the yokes and links and having eccentric portions engaging the links and serving when rotated to draw the yokes toward the rails and clamp all parts.

**Car Wheel**, 899,680; Oswald S. Pulliam, of Pittsburg, Pa. App. filed Oct. 11, 1907. A steel-tired car wheel having a cast-metal wheel center comprising a hub portion and a plurality of radially extending segmental members formed integral with the hub portion, each of said members formed with a waved or corrugated portion and a tire-contracting member.

**Car Fender**, 899,689; G. F. Walker, of Ambridge, Pa. App. filed Feb. 1, 1908. Comprises a pair of doors located above the fender and normally open, which doors are tripped by the person struck by the fender, whereupon they close about said person and thereby prevent him from falling off the fender.

**Guard-rail Clamp**, 899,694; George L. Hall, of New York, N. Y. App. filed Aug. 22, 1907. Comprises a clamp bar provided at one end with means for engaging the base of a rail and at its other end with an upwardly extending yoke, a wedge formed with a track-engaging side and with an inclined side adapted to engage the clamp bar, and a bolt connected to the rear end of the wedge and to the clamp bar, said bolt being arranged outside of the vertical plane of the wedge.



Brake Release, Pat. No. 899,919

**Rail Connection**, 899,697; August S. Lind, of McKeesport, Pa. App. filed May 6, 1908. Has spiced bars with pins formed on their inner face, longitudinal shoulders and outwardly extending and downwardly inclined base flanges formed on each of said bars, and a link adapted to engage said shoulders and pass beneath the base of the rails.

**Controller Regulator**, 899,717; Cyrus P. Ebersole, of Keokuk, Ia. App. filed Dec. 16, 1907. Has a pawl and detent arrangement to cause a slow, step-by-step movement of the controller when the motors are started. Provides a yieldable clamping connection between the hood of the controller regulator and the controller handle, so as to accommodate various sizes and makes of handle.

**Railway Car**, 899,763; Edward T. Robinson, of St. Louis, Mo. App. filed Feb. 11, 1908. Relates to the storing of the windows when the car is to be used in an open condition.

**Air Brake**, 899,844; Augustus A. St. Clair, of Indianapolis, Ind. App. filed Nov. 26, 1907. Comprises means for quickly reducing the train line pressure, a predetermined and fixed amount, at each individual car immediately upon the primary reduction of the engineer's valve.

**Trolley-Wire Hanger**, 899,858; James Bryan, of Pittsburg, and Harry Etheridge, of McKeesport, Pa. App. filed March 20, 1907. A connection for the ear and insulator hood adapted to permit different alignments between the trolley and the guy wire and in which the guy wire is arched upward over the trolley wire so that the latter is substantially in horizontal alignment with the strain on the guy wires. Has a special bolt lock for holding the parts together.

**Aerial Trolley Support**, 899,859; James Bryan, of Pittsburg; Harry Etheridge, of McKeesport, and Edgar McCormack Balsinger, of Pittsburg, Pa. App. filed April 18, 1907. Relates to a supporting arm for the above hanger which projects laterally from a central post, and has a pair of depending insulator studs between which a short guy wire is tightly stretched.

**Rail Joint**, 899,883; Eustace May, of Shryock, W. Va. App. filed Feb. 4, 1908. The rail ends have projecting tongues adapted for engagement with a hollow splice bar having recesses adapted for engagement with the tongues of the rails, the splice bar being provided with flanges adapted to engage the base flanges of the rails, whereby the splice bar may be effectively retained in position upon the rails by suitable spikes inserted within the ties of the rail and engaging the flange of the splice bar.

**Brake Release**, 899,919; Augustus A. St. Clair, of Indianapolis, Ind. App. filed Nov. 26, 1907. Relates to that class of air brakes in which a compression spring is provided for normally setting the brakes independent of any air pressure; provides means for releasing the compression spring.

**Railway Tie**, 899,976; John D. Hazlet and George W. Haight, of Franklin, Pa. App. filed Dec. 6, 1907. The tie members are of substantially cross form and made of channel iron. Tie rods are provided having clamps at each end which engage the rails and the longitudinal arms of the cross-shaped tie.

**Metallic Rail Tie**, 899,990; Alexander S. Kazimer, of Fishkill-on-the-Hudson, N. Y. App. filed Oct. 12, 1907. A metallic hollow railway tie having openings in its upper side, pivotally mounted rail-securing arms having their lower and major portions disposed in said hollow tie and their upper ends extended through the openings and provided with means to engage the base flanges of a rail, and means located within the hollow tie to adjust and secure the rail-securing arms.