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### The Returns of Electric Railways for 1910

The 1911 edition of the *McGraw Electric Railway Manual*, formerly entitled *American Street Railway Investments*, contains interesting statistics regarding the operations of the electric railways of the country and some of these statistics are republished in the current issue of the ELECTRIC RAILWAY JOURNAL. In part they correspond to those which have been compiled for the ELECTRIC RAILWAY JOURNAL in previous years directly after the publication of *American Street Railway Investments*. It was thought best this year to have the statistics appear first in the publication containing the returns on which the totals were based, but in order to make the record complete so far as this paper is concerned, the tables of totals for the different states and for the entire country are also printed in this issue. The most important improvement from the plan of previous years is in the compilation of totals, so far as they are available, of gross earnings, operating expenses, net earnings, passengers carried and transfers issued. The returns in this respect are incomplete, but they indicate a gross earning power for the companies reporting of \$478,873,671 during 1910. Another improvement made in the compilation of the statistics of this year was the computation for the first time of the total authorized stock and funded debt. In preceding years the totals of only the outstanding capital stock and funded debt have been given. Some of the changes in track, etc., from the record of previous years are due to differences in classification in the compilation of the statistics, but these are explained in the text, which is published elsewhere.

### Seats for Women and Children First

This week an interesting attempt was begun by the New York police to ameliorate the rush-hour conditions for women and children at the Manhattan terminal of the Brooklyn Bridge. At this place there are eight surface car loops along four of which high railings separate the opposing streams of alighting and boarding passengers. This plan, coupled with effective police regulation, has been very effective in preventing the scuffling and accidents which formerly occurred between passengers attempting to board cars and those wishing to alight. But it still failed to prevent the stronger and more ruthless men and boys waiting at the terminal from obtaining precedence over women in the scramble for seats. To eliminate this condition the police are now permitting women and children to board the cars as soon as the first stop is made, or that to discharge passengers, and before the car reaches the section reserved for men. The present trial

is in operation on three loops, but will doubtless be extended to others if its present success continues. The responsibility for this departure rests with the police, as it properly should in extreme cases of this kind. No matter how ready a railway company may be to improve the amenities of travel a point is sometimes reached when politeness and even decency can be secured only by the presence of the official police club. The strain upon New York transportation facilities has been great for so many years that it seems to have dulled the sense of courtesy in the traveling public. Any effort of the railway to have applied this "Jim Crow" measure would probably have been denounced as an attack upon the sacred liberties of the American citizen. We trust that the Brooklyn Bridge experiment will prove as satisfactory as the police regulation of vehicular traffic, which has now become a matter of course in New York and other large cities. Official co-operation in matters of this kind will do much to enable electric railway managements to eliminate the worst features of the crowding which seems to be an unavoidable accompaniment of the American rush hour.

#### Eliminate Rule-of-Thumb Construction in the Way Department

The differences between the methods followed in the erection of wooden and of steel buildings are strikingly paralleled in the field operations of the way departments of electric railways. The builders of a frame house saw, chisel, trim and otherwise adjust most of their materials at the place of installation, whereas the erectors of a steel structure are supplied with finished members all marked as to their exact location. Many way departments still do most of their fitting at the place of installation because they have not studied the possible economies which would ensue if most of the finishing work was done at one place and in accordance with the scientific calculations of the engineering staff. In the erection of a trestle, for instance, much waste in lumber may usually be avoided if every piece is cut at the way department shops according to a drawing and then marked with the proper bent number as a guide for the construction gang. This method will also eliminate any loss of time in waiting for a given member to be made to shape, and it will also minimize the amount of material to be hauled. In like manner, it is often feasible to bend rails and drill plates at the shops rather than in the field. The greatest advantage of such centralization lies in the opportunity to use accurate, high-grade machinery at one place under the charge of expert master carpenters and master machinists instead of relying on the rough and ready portable tools used by rule-of-thumb construction foremen. The contrast between these two practices shows how at least one principle of efficiency engineering, namely, the delivery of finished material to the assembler, can be applied to the operations of the way department. These considerations pertain more particularly to city railways whose track gangs are within easy call of headquarters. It is a fact, nevertheless, that the concentration scheme described has made good in saving time and money on a combined city and interurban system which operates several hundred miles of cross-country track.

#### A COMPARISON OF OPERATING FEATURES OF TWO IMPORTANT THIRD-RAIL ROADS

The Aurora, Elgin & Chicago Railroad, operating westward from the business center of Chicago, as described in this and in the two preceding issues of the *ELECTRIC RAILWAY JOURNAL*, forms an excellent subject for profitable study to those interested in suburban traffic conditions. The service given by this line is comparable with that which an electrified steam road might give to and from a metropolitan terminal. It operates limited trains at very high speeds and local trains at speeds which are high in comparison with those of its steam competitors.

In type of construction and in character of schedules this Illinois road differs widely from the usual interurban trolley road. It connects Chicago with a closely built suburban territory and is favored with commuter traffic which can be depended upon to fill a fixed number of trains night and morning each day in the year. This is a favorable traffic condition as compared with that of some trolley roads which do a heavy business in the summer and a light business in the winter. By reason of this regular commuter traffic the Aurora, Elgin & Chicago Railroad is enabled to handle summer excursions during the middle of the day in the same cars that are used at night and morning for the commuters. Thus it keeps its cars operating in revenue service for a larger part of the day than it could under less favorable conditions.

The closest parallel to the third-rail division of the Aurora, Elgin & Chicago Railroad, when both service and equipment are considered, is probably the West Jersey & Seashore branch of the Pennsylvania Railroad, and a comparison is possible owing to the valuable paper on the latter road by B. F. Wood read before the American Institute of Electrical Engineers and abstracted in the *ELECTRICAL RAILWAY JOURNAL* for July 1, page 19. In many particulars of physical equipment and traffic conditions the roads bear a close resemblance. Perhaps the two points of greatest difference are the monthly fluctuations in traffic and the station load-factor. On the New Jersey railway the car miles run in mid-summer are 100 per cent greater than in mid-winter because of the pleasure traffic between Philadelphia and Atlantic City, whereas on the Illinois railway the traffic conditions are very uniform. Finally, the station load-factor of the New Jersey railway is comparatively even lower than this condition would require because of the extensive sale by the Illinois road of energy for commercial purposes. In the following comparison the third-rail division only of each property is considered, although the Illinois road owns and operates some 75 miles of trolley lines and the New Jersey road is part of a large steam railroad system.

The Illinois road has 66 miles of route and 97.8 miles of track and the New Jersey road has 74.3 miles of electrified route and 150 miles of electrified track. The location of population along the two roads is not widely different. Each road has one metropolitan terminal, but while the Illinois road reaches the center of the business district of Chicago over the elevated structure of the Metropolitan West Side Elevated Railway, passengers on the New Jersey road have to transfer at Camden and reach Philadel-

phia on ferry boats. Suburban settlement has taken place on both roads largely in proportion to the time required to reach the property from the metropolitan terminals.

The track of the Illinois road is laid with 80-lb. running rails and that of the New Jersey road with 85-lb. and 100-lb. running rails. The New Jersey road has a smaller number of curves and grades because of the flat country through which it is built. Power is distributed to the cars of both roads through 100-lb. third-rail conductors of the exposed type. The third-rail on the New Jersey road is of track steel and has a lower conductivity than that on the Illinois road, which is of a special composition.

Train service on the two roads does not vary greatly. The average train on the Illinois road consists of 1.59 cars and that of the New Jersey road 3.518 cars. Although the passenger cars of both roads seat the same number of passengers, the difference in carrying capacity for average trains is not so great as the foregoing figures would seem to indicate, because many trains of the New Jersey road include mail or baggage cars or both. The Illinois road's service has greater variety than that of the other road because parlor and dining cars and funeral and express trains are operated.

The car-mileage statements for 1910 show that the Illinois road operated 3,456,425 car miles and the New Jersey road 4,552,056 car miles. The figures for the former road include passenger, work and express cars, while those for the latter road include passenger, baggage and mail cars. Each road operates limited and local trains at high rates of speed. The fast trains on the Illinois road average 41.2 m.p.h. and those on the New Jersey road 43.3 m.p.h. But these schedule speeds are not a correct indication of the maximum speeds in either case because the limited stops on both roads, if we except a few trains on the West Jersey & Seashore Railroad, are close together. Those on the Illinois road are probably the closer, as they average only 3.2 miles apart. Local trains on the Illinois road are scheduled at 32.7 m.p.h. and the stopping points average only 0.9 mile apart. Motive power of high capacity is demanded by these fast schedules.

The cars on both roads seat fifty-eight passengers. The Illinois road operates four-motor, two-motor and trail cars, while each car of the New Jersey road is equipped with two motors. Motors of 125 hp capacity are used by the Illinois road and of 200 hp capacity by the New Jersey road. The four-motor cars of the Illinois road weigh 84,000 lb., the two-motor cars 74,000 lb. and the trail cars 55,000 lb., while each car of the New Jersey road weighs 94,500 lb.

The Aurora, Elgin & Chicago limited trains average two motors, or 150 hp, per car and weigh 278 lb. per horsepower and 1192.2 lb. per passenger seat. The local trains on the same road average three motors, or 375 hp, per car and weigh 210.7 lb. per horse-power, or 1362.1 lb. per seat. The New Jersey trains weigh 238.1 lb. per horse-power of motor capacity and 1630 lb. per seat. Energy consumption at the cars, including thus the distribution losses, compares about as might be expected from the running speeds and car weights mentioned. The trains of the Illinois road use 4.29 kw-hours per car mile and those of the New Jersey road require 4.83 kw-hours per car mile.

The difference between the summer and winter traffic

on the New Jersey line is sufficient to explain the difference in the average mileage per car per day obtained by the two roads. The figure for the Illinois road is 175 miles per day and for the New Jersey road is 134 miles per day. The managements of both roads have recently announced the early purchase of additional cars.

The buildings of the Illinois road provide no storage space for cars except for those under repair. It is the theory of the management that on a road which keeps its cars in service from eighteen to twenty-four hours per day the overhead expense for carhouses is not warranted, except for the extra equipment that is not in daily use.

Comparing the total output of the generating stations of the Illinois and New Jersey roads we find that in 1910 the plant of the New Jersey road generated 28,312,500 kw-hours, whereas the Illinois figure was 38,764,000 kw-hours. But of this amount 5,590,000 kw-hours were delivered to lighting and power customers as alternating current, leaving 33,174,000 kw-hours as the output from the generating station to the railway substations. The direct-current output of all rotary converters in the substations was 21,379,500 kw-hours. Of this, however, 6,540,000 kw-hours were used on the trolley divisions or sold to d.c. customers. Deducting this from the total output of the substations we have 14,839,500 kw-hours as the d.c. output of the substations for use on the third-rail division. The substations of the New Jersey road delivered 21,972,300 kw-hours. The New Jersey road's substations exceeded the output of the Illinois road's substations by about 48 per cent, while the car mileage requiring the energy exceeded that on the Illinois road by only 31 per cent. On the other hand, the efficiency of transmission between the power station a.c. busbars and the substations d.c. busbars was 81.6 per cent on the New Jersey road as compared with about 65 per cent on the Illinois property.

The Illinois road has seven substations, with a total capacity of 8500 kw, of which about 6000 kw is utilized by the third-rail division. The New Jersey road has eight substations with a total capacity of 17,000 kw. The substation capacities per mile of track are 61.3 kw for the Illinois road and 113.3 kw for the New Jersey road. Considering substation capacities per passenger car operated we have 120 kw for the Illinois road and 212.5 kw for the New Jersey road. A twenty-four-hour service is supplied from the Illinois station, while no trains are run on the New Jersey line between 1 a. m. and 4 a. m. On the basis of output per kilowatt of substation capacity, the output of the Illinois road last year was 2473.1 kw-hours and that of the New Jersey road was 1292.4 kw-hours. In other words, the substation load-factor on the Illinois road was almost twice that on the New Jersey road.

Both roads are subject to severe competition. The Illinois road is paralleled for a considerable distance by five steam railroads, three of which operate transcontinental trains at high speed in addition to frequent suburban trains. Its chief defence against this competition is its higher speeds and the greater accessibility of its stations. The competition to the New Jersey road is principally the high speed service between Philadelphia and Atlantic City supplied by two double-track steam lines. Both of these lines have a shorter route into Philadelphia; nevertheless, the electric road secures much of the through business.

# Rolling Stock Maintenance and Other Operating Features of the Aurora, Elgin & Chicago Railroad

Reasons Controlling Car Design and Motor Capacity Are Given As Well As Costs of Maintenance For Cars, Transmission Lines and Substations. The Article Also Presents a Description of the Lighting Systems Operated, One of Which Uses 25-Cycle Current

Illustrated articles in the two preceding issues of this paper have described the track and roadway operating methods and the power generating and distributing system of the Aurora, Elgin & Chicago Railroad. The following article concludes the series on this property:

The rolling stock equipment of the third-rail division includes fifty passenger cars, all of which have heavy steel underframes, semi-steel side construction and mahogany interior finish. The cars are designed for train operation and have end doors and Van Dorn couplers. They are equipped with automatic air brakes and electromagnetic conductor's signals which are operated by utilizing one wire in the regular train control cable.



Aurora, Elgin & Chicago—Three-Car Train

The cars originally purchased for the third-rail division were 47 ft. 10 in. long. All were built to conform to the clearances of the Metropolitan West Side Elevated Railway and were provided with running gear for operation in trains around the sharp curves on the elevated structure. After two or three years of operation it was found that the car length could be increased to 53 ft. 4 in. and still meet the elevated track operating conditions. This length accordingly is the present standard.

Six years ago the original straight air-brake equipment was replaced by the Westinghouse AMM schedule of automatic air having the features of graduated release, quick recharge and high emergency braking power. GE 66-B 125-hp motors are standard on the third-rail division. Originally all motor cars had quadruple equipments and a certain number of the standard passenger cars without motors were used as trailers, but the severity of the service has made it advisable to equip most of the former trail

cars with two motors each. This change has greatly increased the flexibility of operation because each car can now be moved by its own motors, thus permitting every train to be made up with the most suitable number of motors per train, which often was found impossible when some of the cars had no motors under them. The four-motor passenger cars, without load, weigh 84,000 lb. complete.

Owing to the very high speed conditions and the short length of the first thirty cars put in service, considerable difficulty was experienced in making the cars ride comfortably. It was found necessary to discard all of the trucks under these cars and replace them with a truck of the double-equalizer M. C. B. type designed by the company's engineers in accordance with the requirements of severe service. The original trucks were of the box-holster type having small coiled springs and no elliptics. The new trucks, with three full elliptic springs, have not only improved the riding qualities of the cars, but have noticeably decreased the maintenance cost of the rolling stock equipment.

All recent car equipments have been installed with the wiring in iron conduit, and the older cars as they are shopped are being similarly wired.

The freight and miscellaneous equipment of the third-rail division includes three motor express cars, one combination express car and snow plow, one four-motor nose-type snow plow and twenty box, gondola and flat cars.

The rolling stock of the Fox River division consists of forty-seven single-truck cars and eighteen double-truck cars for city service. The interurban equipment on this division includes twelve double-truck motor cars and one baggage-express car, in addition to twenty utility cars used by both city and interurban sections of the Fox River division.

The latest city cars purchased were built by the Niles Car & Manufacturing Company and were designed for pay-as-you-enter fare collection. No decision, however, has yet been reached as to the advisability of the rearrangement of the platforms of the other cars. The interurban cars of the Fox River division are wired in iron conduit and are being standardized as fast as overhauled.

The snow-fighting equipment consists of three single-truck sweepers and two double-truck plows on the Fox River division. Similarly on the third-rail division the equipment consists of one double-truck nose plow and two detachable noses, each nose mounted on a single pair of wheels and so arranged that it can be fitted in a short time to one of the company's baggage and express motor cars.

All oiling and inspection of cars on both divisions are done on a mileage basis, the intervals on the third-rail division being 800 miles and on the trolley division 600 miles. Overhauling is done about every 60,000 miles.

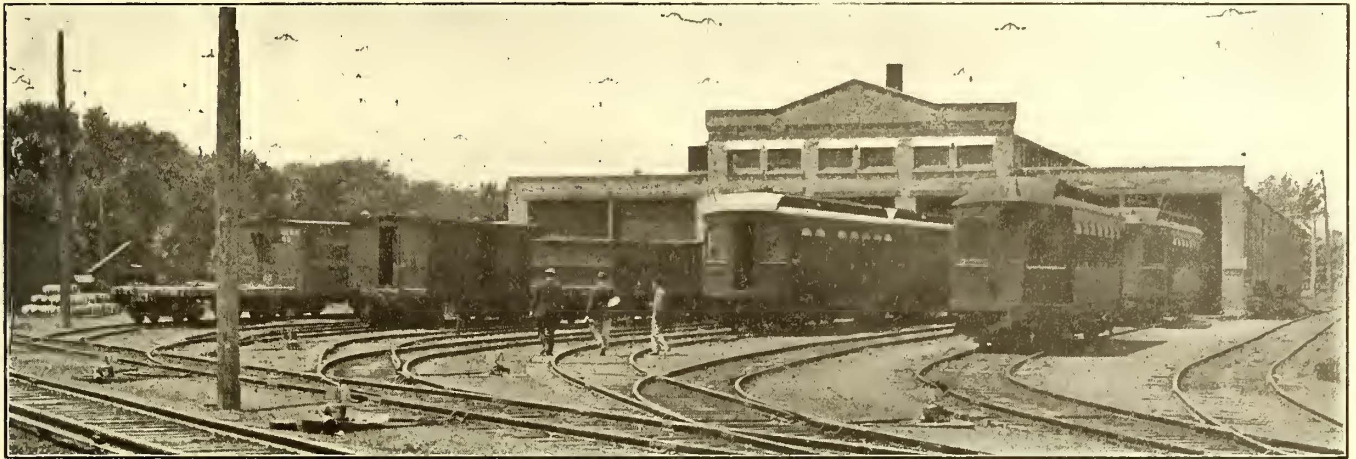
## SHOP FACILITIES

With the consolidation of the third-rail division and the Fox River trolley division in 1904 a rearrangement of the shop work became necessary. At that time all of the third-rail equipment was maintained at the central shops at Wheaton and the Fox River line had division shops at both Aurora and Elgin. Soon after consolidation the shop

ity, manufactured by Niles-Bement-Pond. A wheel-turning lathe of Niles manufacture also has been installed. There has been added from time to time a very extensive equipment of air tools, gas-heating appliances and smaller equipment for the machine and carpenter shops.

## GEARS AND PINIONS

It is interesting to note that, although the engineering



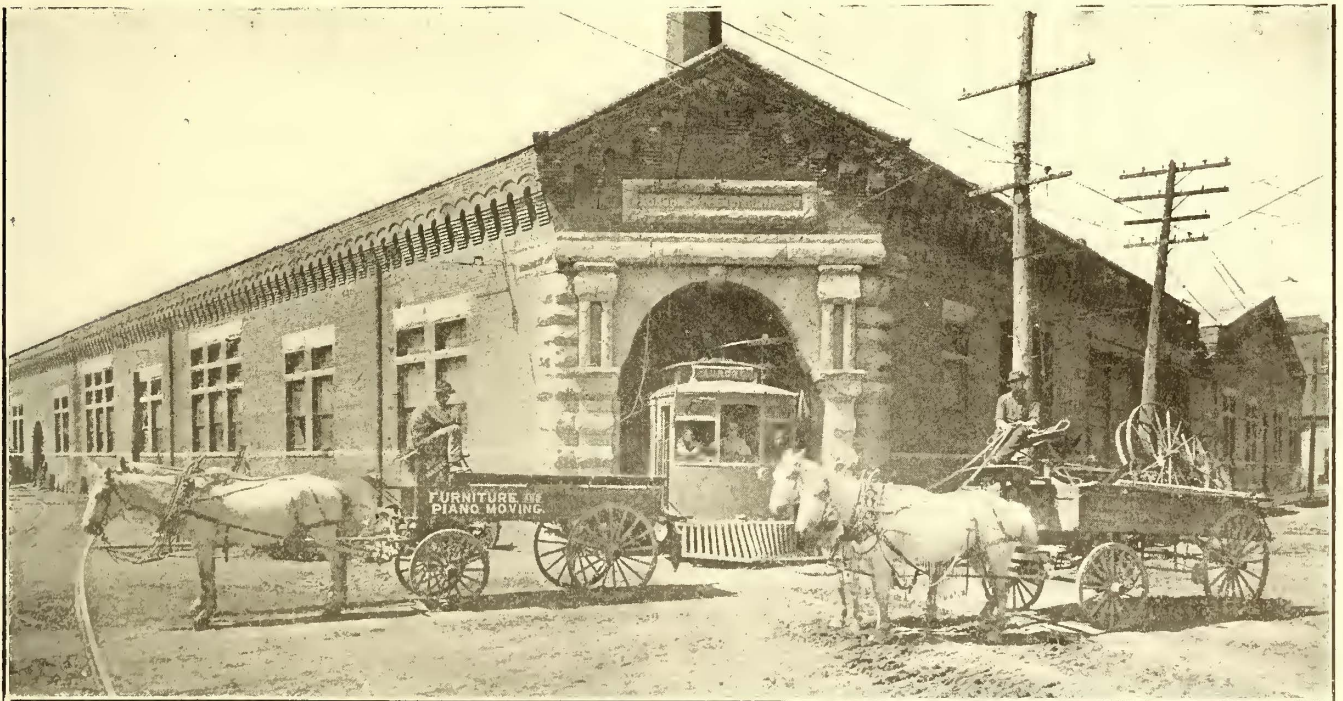
Aurora, Elgin & Chicago—Main Car Shop and Yards at Wheaton

work was discontinued at Elgin and only regular inspection work was done there, all the overhauling and heavy repairs for the trolley division thereafter being performed at Aurora. It was found impracticable to consolidate the Aurora and Wheaton shops because of dead mileage, but certain work for the Fox River division is now done at Wheaton, namely, the renewal of wheels, all armature and winding work, painting and varnishing.

Recently the Aurora shop equipment has been increased

department made thorough studies with a view to using gearing for a lower speed than 70 m.p.h., the results of the investigation as well as experiments with cars geared for slower speeds, show that the fast schedules cannot be made unless extremely high speeds are reached between stops.

There has been a continual quest for GE-66 gears and pinions which would stand up under the severe service on the third-rail division, and many types of gears and pin-



Aurora, Elgin & Chicago—Freight and Express Station at Aurora

by the addition of an 18-in. x 10-ft. engine lathe, several smaller tools, such as drill presses, forge, conduit benders and a number of gas-heating appliances and compressed-air tools and hoists. At the Wheaton shops for the third-rail division the original wheel press, which was of 150 tons capacity, has been replaced by one of 300 tons capac-

ities have been tried, including oil-treated pinions and the removable forged-rim gears. The life of these latter has averaged 223,000 miles for the gears and 271,000 miles for the pinions. The company has also been trying for nearly two years with particularly good results the specially hardened gears and pinions made by the Tool

Steel Motor Gear & Pinion Company, and the indications are that these will have a much greater life. Originally the motor gears had fifty-eight teeth on three pitch and the pinions had thirty-six teeth. Three years ago the pitch was changed to 2.489, the gear having forty-eight teeth and the pinion thirty teeth. The latter type of gear with

mechanically remove the sleet or make contact where the sleet is the thinnest.

MECHANICAL CAR DETENTIONS

Table I shows for the third-rail division the causes of car and equipment failures requiring the attention of the shop or terminal forces. It should be noted that a large number of these failures were not such as to delay the service.

Table II shows the detailed costs for maintenance and operation of the transmission, rolling-stock and substation equipment of the third-rail division only. The costs on the trolley division are much lower.



Aurora, Elgin & Chicago—Interior Standard Passenger Coach

the larger teeth greatly reduced the breakage, the gear ratio remaining practically the same.

BRAKE SHOES

The requirements of the braking service on the third-rail division are especially severe. At one time the company was obtaining from 4000 miles to 4500 miles of wear with gray-iron shoes having steel backs. The conditions were studied and specifications were drawn asking for shoes that would give a life of not less than 7500 miles and not more than 9000 miles, but it was found impossible to get shoes to meet these requirements without unduly wearing the wheels. A soft-iron shoe that gives a high braking power and has a chill on both ends to maintain even wear has finally been adopted.

SLEET SHOES

When the road was first operated there was considerable difficulty in collecting current from the third-rail during sleet storms and a method of melting the sleet by the distribution of a solution of calcium chloride was devised. Cans of the solution were carried in the front ends of trains and the mixture was led to the top of the

TABLE II.—THIRD-RAIL DIVISION—COST OF MAINTENANCE. AURORA, ELGIN & CHICAGO RAILWAY

	Cost per 1000 Car Miles
<b>*Electric line:</b>	
Transmission line and poles.....	\$0.396
Third-rail .....	.223
Third-rail crossing cables.....	1.099
Track bonding.....	.028
Miscellaneous line expense.....	.200
<b>Total electric line.....</b>	<b>\$1.946</b>
<b>*Cars:</b>	
GE-66 motors, not including armatures.....	\$2,330
GE-66 motor armatures.....	1,500
Type-M control apparatus.....	1,090
All wiring and switches.....	.470
Trolley and third-rail shoes and parts.....	.500
Car body and trimmings.....	1,760
Trucks, including pilots.....	1,435
Wheels and axles.....	1,200
Compressors and governors.....	1,110
Painting and varnishing.....	.504
Brake shoes, all kinds.....	1,030
<b>Total car operation.....</b>	<b>\$12,929</b>
<b>*Cleaning, oiling and inspection:</b>	
Car cleaning.....	\$1,980
Car-cleaning supplies.....	.439
All other supplies.....	.934
Oiling and packing.....	.387
Lubricants and waste.....	.562
Motor and electrical equipment inspection.....	1,310
Car and truck inspection.....	1,370
Shop repairs, etc.....	.400
All other carhouse wages.....	.864
Heating and lighting shops.....	1,580
<b>Total cleaning, oiling and inspection.....</b>	<b>\$9,826</b>
<b>*Substation operation:</b>	
Rotary converters.....	\$1,220
Rotary converter transformers.....	.069
Oil switches.....	.103
Switchboards, etc.....	.275
<b>Total substation operation.....</b>	<b>\$1,667</b>

\*Note—The above costs apply to third-rail division only. Costs on Fox River division are much lower, owing to lighter equipment and less severe service.

TABLE I.—CAUSE OF CAR AND EQUIPMENT FAILURES ON THIRD-RAIL DIVISION IN 1910.

Causes of Failures	Number of Causes Total	Per Cent of Total
Car body .....	13	2.0
Brake troubles .....	51	7.8
Compressor, governor valves, piping, etc.....	82	12.5
Motor troubles, all kinds.....	134	20.0
Control apparatus .....	95	14.5
All other electrical trouble.....	100	15.0
Hot journals .....	104	16.0
Hot motor bearings.....	32	4.9
Gears .....	7	1.7
Pinions .....	2	.3
Trucks, other than brakes.....	7	1.7
Third-rail shoe .....	3	.4
Accidents .....	21	3.2
<b>Total for year.....</b>	<b>651</b>	<b>100.0</b>
Passenger car-miles.....	3,199,044	
Number of car-miles per failure.....	4,914	

third-rail and distributed in advance of the shoe. While this method served to keep the trains in operation during severe sleet conditions, it had a bad effect on the insulation of the third-rail and the car wiring and led to the development of a side-contact shoe. These shoes as now used have a cross-section similar to the letter "V" inverted. They ride on the edges of the rail head and thus either



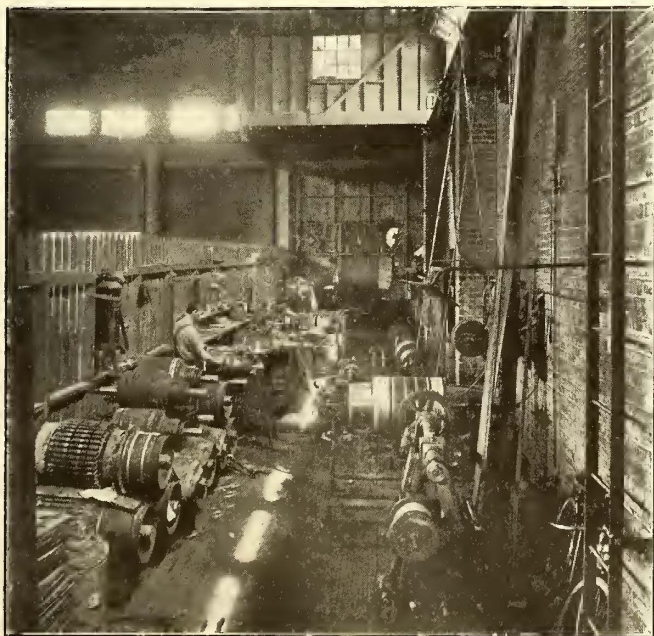
Aurora, Elgin & Chicago—New Limited Destination Sign

## NEW CLASSIFICATION SIGN

A new classification sign has been developed for use on the limited trains. The purpose of this sign is to indicate to people on the platforms whether a train is "limited," and also to show them to what destination it is scheduled. The use of such a sign prevents misunderstanding on the part of passengers waiting at stations where the train is not scheduled to stop and also avoids the loss of time by passengers mistaking one train for another, as, for example, flagging an Elgin limited when they wish to board an Aurora limited. These new signs, which are the result of study over a period of several years, are 30 in. square and are made of two pieces of sheet steel, each 15 in. x 30 in. in size and hinged at the center so that one piece folds against the other. When in the folded position the sign cannot readily be seen because the outside of it is painted the same color as the dash of the car. Thus no indication is given. When the lower half is dropped a white sign, 30 in. square, is displayed in the center of which is an 8-in. lens illuminated by a 16-cp lamp. The name of the train's destination station is painted on the white background.

## ILLUMINATED ORDER HOLDER

A new order holder also has been developed on this road. This consists of a metal frame about the size of an order blank mounted to the left and just above the controller. The frame has a clip for holding the order. Attached to the top of the frame, just above the order, is a small bronze box, square in section, which contains a small electric lamp. One side of the box is fitted with a diamond-cut lens of red glass so that the motorman may note readily whether the lamp within is burning or not. The bottom of the box is fitted with a shutter which the motorman can push to one side and thus obtain direct illumination on his order without the illumination being sufficient to disturb his view ahead of the car. This small lamp as used for illuminating the order is similar to an air-gage lamp and is operated in the same circuit with such lamps.



Aurora, Elgin &amp; Chicago—Armature Room Wheaton Shops

These order holders have been found particularly satisfactory because they furnish a convenient means for the crews to display their orders and thus the common practice of carrying orders about in coat pockets and hats is avoided.

## LIGHTING BUSINESS

With the consolidation in 1904 of the Elgin, Aurora &

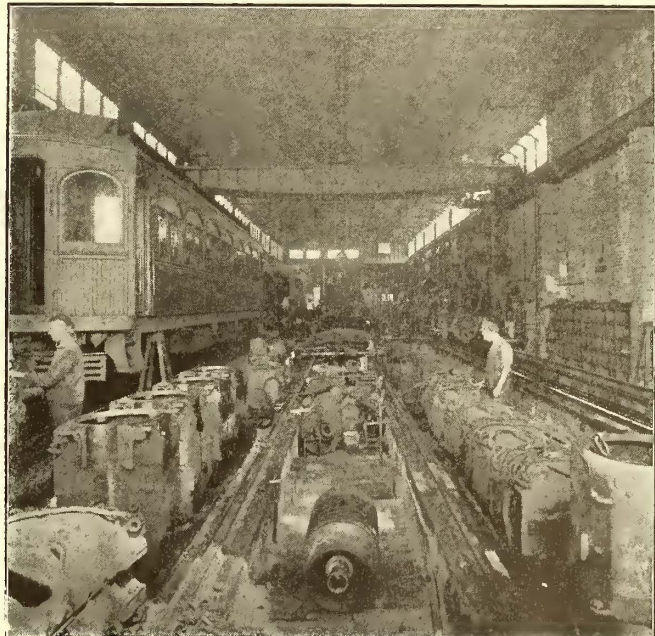
Southern Traction property with the Aurora, Elgin & Chicago Railroad Company the latter company acquired the lighting business of the city of Elgin, which has about 26,000 inhabitants. At that time energy was supplied from an antiquated steam-generating station, one of the first installed in that part of the country. The entire equip-



Aurora, Elgin &amp; Chicago—Dispatcher's Office and Shop Yards at Wheaton

ment consisted of small high-speed automatic engines, each driving two 125-volt Edison bipolar generators, ranging in size from 25-kw to 60-kw capacity.

As soon as the company obtained this property plans were inaugurated for the reconstruction and extension of the service. These resulted in the building of a modern lighting substation at Elgin and the rehabilitation and extension of the distribution system. At the Elgin substation 25-cycle current is taken from the railway transmission system and converted for local use by four motor-



Aurora, Elgin &amp; Chicago—Interior Wheaton Shops

generator sets. Two of these are of 300-kw capacity each, feeding an Edison three-wire d.c. distribution circuit; the other two are of 150-kw capacity each and convert the 25-cycle current into 60-cycle current for 2300-volt distribution about the city. This substation plant also includes rectifier sets for supplying current to 470 magnetite-arc lamps.

There is also provided as a reserve against interruption to the d.c. supply service in the business district an 80-amp storage battery which constantly floats on the line in a fully charged condition. The two motors of a four-unit battery booster set are used as a balancer set for forming a proper neutral on the three-wire system.

25-CYCLE LIGHTING

A fifty-year franchise for commercial lighting and a fifty-year contract for street lighting have just been obtained in West Chicago. For this installation 25-cycle current is used without changing the frequency, as is done in Elgin. The Ingleton rotary-converter substation on the Elgin branch of the third-rail line is about 2 miles from West Chicago and current is taken from the railway transmission system at this point for lighting West Chicago. Transformers have been installed in the substation for reducing the 26,400-volt transmission current to 2300-volts, three-phase, which is in turn transmitted over a 2-mile cross-country line to West Chicago and distributed around the town as single-phase, 2300-volt, 25-cycle current. Induction regulators are installed at Ingleton to control the

Daily Report and Classification of Accidents		
Division _____ 191__		
	No.	PLACE
<b>COLLISIONS WITH VEHICLES</b>		
Bus Car		
Motor Car		
Tram		
Truck		
Wheeled Car		
<b>COLLISIONS WITH CARS</b>		
Bus Car		
Motor Car		
Tram		
Truck		
Wheeled Car		
<b>COLLISIONS WITH PERSONS</b>		
Passenger Car		
Motor Car		
Tram		
Truck		
Wheeled Car		
<b>COLLISIONS WITH ANIMALS</b>		
All Other		
<b>BOARDING &amp; LEAVING CARS</b>		
From Station		
From Car		
From Platform		
From Street		
From Other Building		
From Other Station		
<b>DEPARTMENTS</b>		
Conductor of Car		
Conductor of Train		
Signal Man		
Other		
<b>ELECTRIC SHOES</b>		
On Cars		
In Street		
Third Rail		
<b>WORN OR DAMAGED CLOTHING</b>		
Hats		
Coats		
Shirts		
Other		
<b>INTERFERENCE</b>		
Obstruction		
Excessives		
Other		
<b>MISCELLANEOUS</b>		
Scram in Station		
Down and 9 Locks		
Falling Loads		

Aurora, Elgin & Chicago—Report and Classification of Accidents

wholesale to five municipalities along the road, which distribute it for lighting and miscellaneous uses.

RURAL CUSTOMERS SUPPLIED

This road was one of the first to undertake to supply power from its low-tension distribution system for small installations at farms along its right-of-way. At the present time there are sixty-five customers receiving power from the 600-volt circuits, some of these being fed from the third-rail division and others from the trolley division. Many of these installations include 20-hp and 25-hp motors installed at the farm buildings and arranged for such uses as chopping feed, sawing wood, pumping water, threshing and cleaning grain. In most of these installations the 600-volt current also is used for lighting the premises. The company furnishes power only to the edge of its right-of-way and insists on protecting devices being installed to assure no disturbance on the distribution circuit. The revenue from the average farm customer with a small motor installation is about \$5 per month.

DEPARTMENT MEETINGS

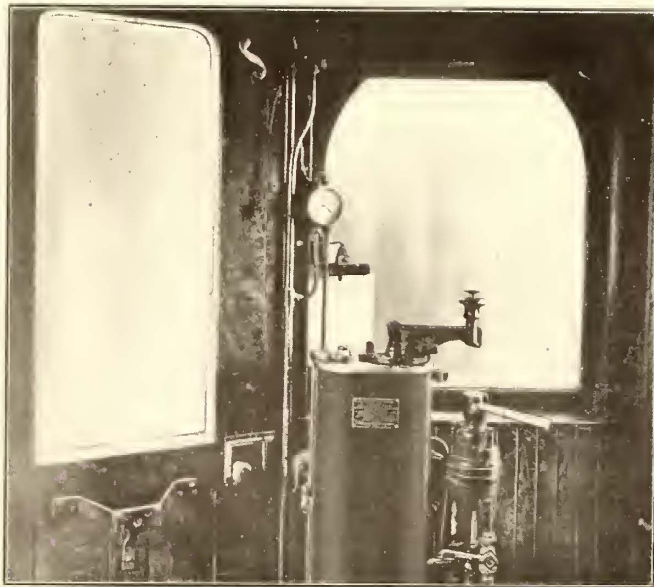
The management of the Aurora, Elgin & Chicago Railroad has obtained excellent results from its plan of regularly holding department meetings. Each day of the week the general manager meets the heads of different departments and discusses problems in hand. The manager presides at all meetings and a stenographer is present to keep a careful note of the points brought up and decided. Those questions which are tabled are summarized for presentation at the meeting the week following. The schedule of meetings are as follows: Monday, transportation; Tuesday, traffic; Wednesday, shops; Thursday, power generation and distribution; Friday, maintenance of way and buildings; Saturday, claims for one meeting and light and power for another meeting.

Each morning the general manager's office is furnished with a report and classification of accidents tabulated on a blank of the form illustrated. The originals of these blanks are 8½ in. x 14 in. in size. Reference to the blank gives the general manager an excellent survey of the irregularities of service for the preceding day.

TRANSFERS IN NEW YORK CITY

A hearing on the question of transfers on the Manhattan surface railways was held by the New York Public Service Commission, First District, on Aug. 15. Letters from the various companies affected by the suggested order of the commission on this subject were placed on the record. Mark Goldberg, a member of the assembly of the New York State Legislature, appeared before the commission to urge definite action for free universal transfers. W. D. Guthrie, special counsel for the bondholders' committee of the Third Avenue Railway, asked that the remarks of Mr. Goldberg be stricken from the record, but this motion was denied.

After the adjournment of the hearing Mr. Guthrie stated that the receivers of the Metropolitan Street Railway Company had proposed recently the issue of universal transfers at 1 cent each on all surface lines in Manhattan. He added, however, that Frederick W. Whitridge, receiver for the Third Avenue Railroad, did not favor the suggestion. This plan would involve the abolition of 168 points at which the Metropolitan and Third Avenue lines now issue free transfers. These points, as well as 151 points where no transfers are now given, would become points where transfers would be issued for 1 cent under the plan suggested. It was also suggested by the receivers of the Metropolitan company that a second transfer should be issued on payment of an additional cent. Mr. Whitridge felt that the public would be opposed to this plan. This proposition was not made to the commission.



Aurora, Elgin & Chicago—Interior of Car Vestibule Showing New Order Holder

voltage for lighting. This service has been found satisfactory, and the use of 25-cycle current has considerably reduced the cost of the first installation.

In addition to lighting Elgin and West Chicago the Aurora, Elgin & Chicago Railroad transmits energy at



# Reports of Electric Railway Operations in 1910

Statistics Published in the 1911 Edition of the McGraw Electric Railway Manual, Just Issued, Relate to Cars, Trackage and Capitalization of Substantially All Companies and Earnings of a Smaller Number of Properties.

The *McGraw Electric Railway Manual*, the 1911 edition of which has just been issued, is the successor to *American Street Railway Investments*. It contains statistics of the combined principal returns of operating electric railway companies reporting for 1910. It has been the practice shortly after the issue of this publication in previous years to compile similar statistics for publication in the *ELECTRIC RAILWAY JOURNAL*. For this plan there was substituted this year the improvement of publication of the principal statistics in the volume containing the detailed returns and these are presented herewith. The form of the statistics has also been changed to some extent. A compilation of the three principal items of operating returns has been included, and while this does not give the full returns of all companies, it furnishes the totals for all that make statements public and therefore indicates the gross earning power of the principal properties in the country.

The statistics published in this issue relate to miles of track, cars operated, capitalization, and also, so far as they are reported, to the items of gross earnings, operating expenses and net revenue. The table on capitalization follows rather closely the form of the table which has been published in previous years in the *ELECTRIC RAILWAY JOURNAL*.

Some explanation of the changes made in the basis of compilation and in the items compiled should be given. The division of States into groups has been followed as in previous years, in order that the basis for comparison might be maintained as closely as possible from year to year. In most instances the returns of interstate properties are included within the State from which the report is made, and in which, as a rule, the major part of the mileage is located. This plan was followed because of the necessity for estimates in all attempts to segregate the various items of track, cars, capitalization, earnings and expenses so as to distribute them between the States on a reasonable basis.

No separation was attempted in the 1910 statistical compilation between electrically equipped cars and other cars for the reason that the returns of many of the companies were incomplete, and failed to show the proportion of motor cars operated as distinguished from other cars. A report of the electrically equipped cars and other cars was requested of the companies, but it was not furnished for a large number of properties.

## TOTALS OF AUTHORIZED SECURITIES

For the first time the compilation includes the amount of the authorized capital stock and funded debt, in addition to the outstanding securities. In the main the excesses in the authorized amounts over the outstanding amounts probably represent a provision for anticipated future requirements, but they also include allowances which, in the case of many underlying companies, will never be issued. Many controlling operating companies prefer to sell their own bonds, secured by a general mortgage under which a large issue is authorized, rather than to increase the small underlying issues outstanding.

The tables show a discrepancy in the number of companies and the miles of track should be explained. The number of companies is much smaller in the table of earnings for the reason that the returns of capitalization necessarily included companies that are underlying parts of large systems, and, therefore, do not make separate reports of earnings as a rule, but preserve their corporate independence and have securities outstanding in the hands

of the public. As the track mileage of companies reporting earnings is smaller than that of the companies whose capitalization is reported, it is given separately so as to show the track mileage on which the earnings are based. The mileage in the table of earnings is that of the companies that reported gross revenue. Some of these companies did not report operating expenses or net revenue and therefore the totals of these accounts do not balance with the gross revenue in some States and in the complete totals for the United States.

The varying fiscal years adopted by the corporations made it necessary to take the returns of gross earnings as made, mostly for the calendar year 1910 or the fiscal year of companies ending at some time in 1910, or, in a few instances, for the fiscal year whose greater part was in the calendar year 1910. Owing to the change of the date of completion of the fiscal year in Massachusetts, the returns from that State are for only nine months with most of the companies. Operating expenses, as reported, include taxes in some cases and not in others, and no effort was made to effect uniformity in the treatment of this item in the statistics.

The number of companies which reported revenue and transfer passengers carried is much less than the number that gave gross earnings, and is, of course, far from complete. The record of transfer passengers is still less full than that of the revenue passengers. In some States the traffic returns are confined to one or two companies. In New Jersey, for instance, the returns are based almost entirely on the report of the Public Service Railway, of Newark.

## ELECTRIFIED TERMINALS

The electrified mileage and electric locomotives of steam railway terminals are reported, but no general attempt was made to allot part of the capitalization or earnings and expenses to this costly but relatively small part of the systems involved. In one case where a report appeared to apply particularly to the electrified section its figures were included, but they did not affect the totals materially. The Illinois Subway Company was omitted in the statistical compilations because of the unusual character of its operations.

Another point which may be mentioned is that the returns include a nominal or no amount for participation certificates which have been issued without actual par value, but have actual market values in excess of many stocks reported at full par value.

By the use of the totals in the tables published in the *ELECTRIC RAILWAY JOURNAL* and the *STREET RAILWAY JOURNAL* in previous years a comparative table was prepared and is published on page 314, giving the number of companies, cars, tracks and capitalization for ten years.

This indicates a small increase in the number of companies in 1910 as compared with 1909, and a larger number of operating companies last year than is shown for any previous year. A decrease is shown in the total miles of track, but this is due to the difference in the basis of compilation, as there is, of course, a regular increase from year to year. It is due in part to the elimination so far as is possible of all but electric railway mileage and is also attributable in part to incomplete returns. The varying practice of companies in including or excluding trackage of all underlying companies complicates the computation for a small part of the total mileage. The number of cars shows a decrease, due to causes similar to those mentioned in connection with the trackage.

INTERCORPORATE HOLDINGS

The outstanding capital stock was determined by elimination of the intercorporate duplicate holdings so far as they were determinable from the returns, and the slight

decrease in 1910 is a small percentage of the total amount shown as outstanding, and follows a similar change in 1909 as compared with 1908. Outstanding funded debt, on the other hand, shows an increase, making a net

MILES OF TRACK, CARS AND CAPITALIZATION OF ELECTRIC RAILWAY COMPANIES IN 1910.

STATE	NUMBER OF RY. COMPANIES	MILES OF TRACK	CARS	CAPITAL STOCK		FUNDED DEBT		TOTAL STOCK AND BONDS	
				AUTHORIZED	OUT-STANDING	AUTHORIZED	OUT-STANDING	AUTHORIZED	OUT-STANDING
<b>NEW ENGLAND STATES</b>									
Connecticut.....	14	1,013.8	2,651	\$62,442,100	\$60,237,300	\$58,105,000	\$36,938,700	\$120,547,100	\$97,176,000
Maine.....	18	527.	795	9,222,400	9,051,200	20,243,575	12,195,075	29,465,975	21,246,275
Massachusetts...	61	3,068.5	10,173	96,087,350	92,217,590	97,597,000	67,731,700	193,684,350	159,949,290
New Hampshire...	2	282.	384	6,482,200	6,407,200	4,327,000	4,008,000	10,809,200	10,415,200
Rhode Island....	9	442.2	1,173	37,322,800	31,585,100	17,403,500	16,426,700	54,726,300	48,011,800
Vermont.....	10	97.	151	4,960,300	4,380,800	4,400,000	3,476,000	9,360,300	7,856,800
<b>Total.....</b>	<b>132</b>	<b>5,430.5</b>	<b>15,327</b>	<b>\$216,517,150</b>	<b>\$203,879,190</b>	<b>\$202,076,075</b>	<b>\$140,776,175</b>	<b>\$418,593,225</b>	<b>\$344,655,365</b>
<b>EASTERN STATES</b>									
Delaware.....	5	48.	81	\$10,870,000	\$8,350,000	\$6,524,000	\$4,979,000	\$17,394,000	\$13,329,000
Dist. Columbia..	7	305.7	1,516	42,726,500	31,372,550	44,941,168	31,331,518	87,667,668	62,704,068
Maryland.....	13	630.4	1,961	35,864,000	23,161,250	91,857,000	70,439,800	127,721,000	93,601,050
New Jersey.....	49	1,311.	2,689	91,800,340	84,589,490	117,728,285	89,404,385	209,528,625	173,993,875
New York.....	146	4,689.	17,608	565,382,100	514,923,222	862,767,140	482,896,250	1,428,149,240	997,819,472
Pennsylvania....	242	4,343.3	8,915	375,057,950	280,456,012	382,771,639	210,210,729	757,829,589	490,666,741
Virginia.....	21	451.3	885	41,795,000	23,547,537	47,152,000	34,394,100	88,947,000	57,941,637
West Virginia...	19	356.2	518	20,500,000	13,500,800	21,975,000	13,077,500	42,475,000	26,578,300
<b>Total.....</b>	<b>52</b>	<b>12,134.9</b>	<b>34,173</b>	<b>\$1,183,995,890</b>	<b>\$979,900,861</b>	<b>\$1,575,716,232</b>	<b>\$936,733,282</b>	<b>\$2,759,712,122</b>	<b>\$1,916,634,143</b>
<b>CENTRAL STATES</b>									
Illinois.....	85	3,147.9	7,810	\$256,260,600	\$152,594,400	\$408,164,000	\$292,416,349	\$664,424,600	\$445,010,749
Indiana.....	47	2,244.8	2,281	120,685,000	91,750,000	149,525,900	90,537,750	270,210,900	182,287,750
Iowa.....	30	753.8	1,177	45,370,000	36,595,155	71,905,500	32,613,000	117,275,500	69,208,155
Kentucky.....	11	517.1	1,088	51,000,000	33,633,940	38,735,000	19,890,800	89,735,000	53,524,740
Michigan.....	22	1,454.9	2,636	43,125,000	36,885,200	91,908,000	57,624,000	135,033,000	94,509,200
Minnesota.....	9	497.	954	36,225,000	25,589,000	28,380,000	23,138,000	64,605,000	48,727,000
Missouri.....	23	1,069.2	2,520	117,600,000	83,033,980	152,274,000	114,899,700	269,874,000	197,933,680
Ohio.....	91	4,127.	5,767	272,187,500	200,462,940	229,281,000	126,562,140	501,468,500	327,025,080
Wisconsin.....	26	735.7	1,011	64,603,000	22,323,000	86,055,500	35,084,900	150,658,500	57,407,900
<b>Total.....</b>	<b>341</b>	<b>14,547.4</b>	<b>25,244</b>	<b>\$1,007,056,100</b>	<b>\$682,867,615</b>	<b>\$1,256,228,900</b>	<b>\$792,766,639</b>	<b>\$2,263,285,000</b>	<b>\$1,475,634,254</b>
<b>SOUTHERN STATES</b>									
Alabama.....	13	307.5	670	\$22,177,000	\$17,507,000	\$52,425,000	\$15,966,000	\$74,602,000	\$33,473,000
Arkansas.....	10	103.8	237	10,040,000	5,386,800	10,831,000	5,934,000	20,871,000	11,320,800
Florida.....	10	128.5	242	5,890,000	5,372,000	10,750,000	3,420,500	16,640,000	8,792,500
Georgia.....	14	409.	685	24,034,600	23,471,000	61,400,000	23,823,500	85,434,600	47,294,500
Louisiana.....	8	257.2	726	54,345,900	31,591,300	94,530,000	33,444,500	148,875,900	65,035,800
Mississippi.....	10	106.4	163	8,950,000	4,462,670	11,075,000	5,506,500	20,025,000	9,969,170
North Carolina..	12	135.2	247	24,704,500	19,044,400	24,415,000	10,579,700	49,119,500	29,624,100
South Carolina..	6	118.5	176	12,900,000	6,300,700	6,000,000	4,146,000	18,900,000	10,446,700
Tennessee.....	11	349.4	820	20,800,000	19,949,900	59,125,000	25,421,000	79,925,000	45,370,900
<b>Total.....</b>	<b>94</b>	<b>1,915.5</b>	<b>3,966</b>	<b>\$183,842,000</b>	<b>\$133,085,770</b>	<b>\$330,551,000</b>	<b>\$128,241,700</b>	<b>\$514,393,000</b>	<b>\$261,327,470</b>
<b>WESTERN STATES</b>									
Arizona.....	5	57.5	41	\$815,000	\$650,000	\$100,000	\$50,000	\$915,000	\$700,000
California.....	55	2,244.5	4,068	249,507,250	192,559,350	301,491,000	141,172,000	550,998,250	333,731,350
Colorado.....	16	518.8	791	48,020,000	21,111,700	67,848,000	29,436,000	115,868,000	50,547,700
Idaho.....	5	131.	54	8,900,000	4,784,000	5,750,000	1,413,000	14,650,000	6,197,000
Kansas.....	15	256.8	366	5,700,000	3,583,220	10,330,000	5,593,000	16,030,000	9,176,220
Montana.....	7	130.	150	3,744,615	3,179,615	2,500,000	1,810,000	6,244,615	4,989,615
Nebraska.....	6	237.5	550	23,850,000	12,645,600	14,580,000	10,888,000	38,430,000	23,533,600
Nevada.....	2	10.3	12	2,000,000	1,042,000	1,000,000	135,000	3,000,000	1,177,000
New Mexico.....	2	10.5	11	550,000	400,000	450,000	225,000	1,000,000	625,000
North Dakota...	3	22.5	59	450,000	440,000	300,000	200,000	750,000	640,000
Oklahoma.....	17	197.	256	24,020,000	7,205,300	21,300,000	5,128,500	45,320,000	12,333,800
Oregon.....	9	420.6	1,195	53,990,000	43,290,000	98,481,000	38,432,000	152,471,000	81,722,000
South Dakota...	3	19.5	23	1,000,000	600,000	500,000	200,000	1,500,000	800,000
Texas.....	36	624.2	1,044	40,895,000	29,597,000	35,203,000	20,930,000	76,098,000	50,527,000
Utah.....	6	237.8	297	12,500,000	8,237,500	21,750,000	6,996,000	34,250,000	15,233,500
Washington....	19	936.2	1,960	68,015,000	50,878,200	101,100,000	40,968,000	169,115,000	91,846,200
Wyoming.....	1	5.	14	75,000	75,000	20,000		95,000	75,000
<b>Total.....</b>	<b>207</b>	<b>6,059.7</b>	<b>10,891</b>	<b>\$544,031,865</b>	<b>\$380,278,485</b>	<b>\$682,703,000</b>	<b>\$303,576,500</b>	<b>\$1,226,734,865</b>	<b>\$683,854,985</b>
<b>United States...</b>	<b>1,279</b>	<b>40,088.</b>	<b>89,601</b>	<b>\$3,135,443,005</b>	<b>\$2,380,011,921</b>	<b>\$4,047,275,207</b>	<b>\$2,302,094,296</b>	<b>\$7,182,718,212</b>	<b>\$4,682,106,217</b>

addition in 1910 in the total capitalization outstanding. Most of the companies continue to do their financing through the issue of bonds. This is due in part to the fact that their bonds have a better investment market

than their issues of stock. Some companies, however, have financed their requirements through the sale of preferred stock and will continue to follow that practice. It will be noted that in the entire United States there is a

RESULTS OF OPERATION REPORTED BY ELECTRIC RAILWAYS IN 1910

STATES	NUMBER OF RAILWAY COMPANIES REPORTING GROSS REVENUE	MILES OF TRACK	RESULTS OF OPERATION			PASSENGERS CARRIED	
			GROSS REVENUE	OPERATING EXPENSES	NET REVENUE	REVENUE	TRANSFERS
<b>NEW ENGLAND STATES</b>							
Connecticut.....	8	923	\$7,938,374	\$4,912,418	\$3,025,956	150,358,258	27,588,919
Maine.....	16	512	2,736,977	1,784,355	952,622	41,858,809	4,675,542
Massachusetts.....	51	2,983	27,167,860	17,722,577	9,445,283	524,479,169	21,657,629
New Hampshire.....	15	246	1,487,003	1,006,728	480,275	18,789,590	*
Rhode Island.....	6	409	5,088,123	2,907,237	2,180,886	7,272,933	*
Vermont.....	5	63	474,992	302,020	193,626	3,311,925	56,459
Total.....	101	5,136	\$44,893,329	\$28,635,335	\$16,278,648	746,070,684	53,978,549
<b>EASTERN STATES</b>							
Delaware.....	—	—	*	*	*	*	*
District of Columbia....	4	300.7	\$6,957,762	\$3,567,448	\$3,390,314	52,769,750	17,452,126
Maryland.....	2	404	7,696,155	3,608,396	4,087,759	155,143,785	60,789,807
New Jersey.....	24	1,264.8	16,393,111	9,873,116	6,520,195	259,904,915	82,606,135
New York.....	99	4,509	105,484,620	58,476,958	47,258,029	2,006,801,467	416,220,033
Pennsylvania.....	116	4,169	47,316,190	26,969,097	19,640,267	930,151,488	52,177,638
Virginia.....	4	152.4	1,956,612	1,111,039	1,040,877	32,634,565	12,993,051
West Virginia.....	6	230.5	2,054,338	984,041	1,070,297	17,786,416	957,403
Total.....	255	11,030.4	\$187,858,788	\$104,590,095	\$83,007,738	3,455,192,386	643,196,193
<b>CENTRAL STATES</b>							
Illinois.....	39	2,755	\$51,931,674	\$34,610,382	\$17,321,302	520,876,926	217,022,371
Indiana.....	21	1,881	14,405,732	8,346,272	5,787,092	27,867,869	4,795,331
Iowa.....	14	714	5,936,575	3,711,114	2,223,461	34,103,043	5,230,534
Kentucky.....	5	327	4,265,399	2,442,755	1,822,674	418,751	296,214
Michigan.....	10	1,233	13,075,999	7,900,273	4,899,985	207,640,689	50,833,756
Minnesota.....	4	477	8,660,141	4,273,451	4,355,056	168,707,252	52,850,372
Missouri.....	8	984	21,353,846	11,691,867	9,614,369	370,691,308	153,501,606
Ohio.....	59	3,791	33,442,160	15,905,608	9,127,837	99,098,331	9,985,491
Wisconsin.....	15	690.6	10,965,147	4,288,735	5,734,588	105,883,749	33,679,582
Total.....	175	12,852.6	\$164,036,673	\$93,170,457	\$60,886,364	1,535,287,918	528,201,257
<b>SOUTHERN STATES</b>							
Alabama.....	3	295	\$3,395,258	\$1,642,988	\$1,172,452	12,438,686	2,138,684
Arkansas.....	2	55	1,242,476	659,245	583,231	13,578,650	1,969,527
Florida.....	3	104	1,442,148	798,806	643,342	*	*
Georgia.....	8	395	6,560,831	3,313,022	3,247,809	2,952,743	110,230
Louisiana.....	3	221	6,515,397	3,591,194	2,764,203	80,408,085	19,246,906
Mississippi.....	5	69	720,624	349,193	156,191	1,525,240	236,576
North Carolina.....	6	104.7	1,616,051	1,041,192	574,859	7,383,706	*
South Carolina.....	2	66	1,253,240	727,466	525,574	5,937,822	*
Tennessee.....	5	306.7	4,673,166	3,090,807	2,214,154	24,399,365	13,815,807
Total.....	37	1,616.4	\$27,419,191	\$15,213,913	\$11,881,815	148,624,297	37,517,730
<b>WESTERN STATES</b>							
Arizona.....	—	—	*	*	*	*	*
California.....	11	865	\$13,985,382	7,442,944	\$5,596,044	62,078,879	12,054,308
Colorado.....	3	251	4,459,749	2,322,318	2,137,431	*	*
Idaho.....	—	—	*	*	*	*	*
Kansas.....	5	113	793,956	449,497	354,459	1,205,733	293,776
Montana.....	2	51	774,751	548,840	225,911	1,961,895	96,948
Nebraska.....	3	216.5	3,219,009	1,811,161	1,380,664	10,956,671	1,658,005
Nevada.....	—	—	*	*	*	*	*
New Mexico.....	—	—	*	*	*	*	*
North Dakota.....	—	—	*	*	*	*	*
Oklahoma.....	6	137	1,147,817	718,026	429,791	19,642,632	2,375,544
Oregon.....	3	329.0	7,161,499	3,586,530	3,574,969	786,600	*
South Dakota.....	—	—	*	*	*	*	*
Texas.....	9	375	6,994,117	4,213,809	2,724,772	1,586,153	155,728
Utah.....	2	166	2,662,299	1,538,555	1,123,744	26,600,090	6,222,538
Washington.....	8	856.5	13,467,111	7,834,763	5,632,348	36,074,434	*
Wyoming.....	—	—	*	*	*	*	*
Total.....	52	3,360.9	\$54,665,690	\$30,466,443	\$23,180,133	160,893,087	22,856,847
United States.....	620	33,996.3	\$478,873,671	\$272,076,243	\$195,234,698	6,046,068,372	1,285,750,576

\*Not reported.

margin of over \$750,000,000 between the authorized stock and the outstanding stock. There is a much larger margin between the authorized amount of bonds and the outstanding amount of bonds, and the difference in the total capitalization authorized and outstanding is over \$2,500,000,000.

A detailed comparison between the returns for 1909, as published in the *ELECTRIC RAILWAY JOURNAL* of Aug. 27, 1910, and the returns for 1910, published herewith, shows a large increase in the number of railway companies in the Eastern States. The number of companies in 1910 was 502 as compared with 452 in 1909. The number of companies in the New England States was smaller in 1910 than in 1909, and was less in 1909 than in the preceding year.

This is due to the gradual consolidation of properties which has been a notable feature of electric railway development in New England, particularly in Massachusetts. The number of companies in the latter State, for instance, was sixty-one in 1910, as compared with sixty-six in 1909 and sixty-nine in 1908. A number of these companies failed to earn their full operating expenses for the nine months ended June 30, 1910, the period for which most of the reports were made. Owing to the change of the date on which the fiscal year prescribed by the Board of Railroad Commissioners of Massachusetts ends, these companies completed the fiscal period without the advantage of the returns for the months of July, August and September, which constitute their best traffic season.

The amount of outstanding stock is reported as smaller in 1910 than in 1909 for the group of Eastern States,

the census report and this condition facilitated materially the collection of the data desired. As only a few small companies, however, fail to make full returns regarding their capitalization, trackage and cars the statistics on these subjects afford a valuable record of the progress of the industry since the date at which the census report was compiled.

Where the total number of miles of track operated by electricity is shown as 40,088 in the figures for 1910, the corresponding mileage in the census of 1907 was 34,059.69. This indicates an increase in this period of 6,028.31 miles of track, or 17.7 per cent.

The amount of capital stock authorized as of 1907, according to the census, was \$2,508,054,336; it was \$3,135,443,005 in 1910, according to the returns made by electric railways, or an increase of \$627,388,669. The gain in three years is equal to 25 per cent, or an average of over 8 per cent annually.

#### INCREASE IN CAPITAL STOCK

The amount of capital stock outstanding in 1907, as reported by the Census Bureau, was \$2,097,708,856, whereas the 1910 returns of electric railway companies upon which the latest compilation is based show a total of \$2,380,011,921 outstanding, or an increase of \$282,303,065 in a period of about three years. The percentage of gain is much smaller in outstanding stock than in authorized stock, amounting to 13.5 per cent for the three-year period, or an average of 4.5 per cent a year.

The aggregate amount of the authorized funded debt reported by the census bureau was \$2,322,720,837 in 1907.

TOTALS OF MILEAGE, CARS AND CAPITALIZATION FOR TEN YEARS.

	Total Number of Companies	Miles of Track	Total Number of Cars	Capital Stock Outstanding	Funded Debt Outstanding	Total Capitalization Outstanding
1910	1,279	40,088	89,601	\$2,380,011,921	\$2,302,094,296	\$4,682,106,217
1909	1,253	40,490	91,153	2,427,935,397	2,224,800,236	4,652,735,633
1908	1,252	40,247	89,216	2,444,892,057	2,112,244,086	4,557,136,143
1907	1,238	38,812	86,204	2,251,425,882	1,872,408,516	4,123,834,598
1906	1,164	36,932	84,732	2,039,948,875	1,725,369,000	3,765,317,875
1905	1,081	32,517	79,751	1,844,565,136	1,524,371,926	3,368,937,062
1904	993	29,548	75,904	1,761,571,812	1,455,520,159	3,217,091,971
1903	1,187	29,212	76,186	1,700,726,898	1,401,664,048	3,102,390,946
1902	1,110	25,592	70,006	1,522,068,760	1,272,268,491	2,794,338,251
1901	1,062	22,063	68,777	1,324,072,053	1,086,598,082	2,410,670,135

Central States and Southern States, while the New England States and Western States show an increase.

In the statement of funded debt outstanding, the returns of the groups of companies in the Central States, Southern States and Western States show an increase in 1910 as compared with 1909, while the companies in the New England States and Eastern States show a decrease.

#### COMPARISON WITH CENSUS FIGURES

An interesting comparison may be made between the returns given in these tables and those in the census of street and electric railways of 1907. In the census report the returns of individual companies are not made public, so that many reports are included which are not available for publication under ordinary circumstances. The capitalization and earnings of companies devoted mainly to electric light and power operations, but transacting incidentally a small railway business, were excluded in some instances in the compilation of the *McGraw Electric Railway Manual*, and in other cases of combined operations the reports segregated the earnings so that those used for statistical purposes are from railway sources alone; in most instances, however, the returns of earnings were taken as reported for the year 1910. By the compilation of the statistics in this form revenue derived from regular commercial light and power departments, and also revenue from the sale of electric current as an incidental part of railway operation were included where reported. In the census report the data were excluded for light and power plants where available, and were included where the companies could not segregate their reports so as to make separate returns for the two branches of the business.

The names of individual companies are not divulged in

The aggregate was \$4,047,275,207 in 1910. This indicates an increase of \$1,724,554,370 in the authorized funded debt. The percentage of gain in the authorized bond capitalization is 74 per cent, which is so large that it appears to be due in part to differences in classification. The amount of outstanding funded debt was shown as of 1907 at \$1,677,063,240, and this was increased by the 1910 returns to \$2,302,094,296, or an increase of \$625,031,056. This gain is equivalent to 37.3 per cent in the three years, or an average of 12.4 per cent annually. The increase in the total outstanding capitalization in the same period was from \$3,774,772,096 to \$4,682,106,217, or an increase of \$907,334,121. The gain in this item is 24 per cent during the interval of three years, or an average\* of 8 per cent a year. This rate of gain is a little larger than the average increase in miles of track in the same time. The census shows a total of 83,641 cars for street and electric railways, and the later report, showing an aggregate of 89,601 cars, therefore indicates a gain of 5960 cars, or 7.1 per cent. This is less than one-half of the percentage of increase in track mileage in the same period.

Changes of similar interest may be shown in the statement of earnings. Some of the companies, in making reports for publication herein, separated other income from the revenue from operation. The census table, however, states separately the items of income from other sources and operating earnings and then gives the gross income from all sources. Where the total gross income was reported by the Census Bureau at \$429,744,254 in 1907, the gross revenue shown in 1910 by the smaller number of companies which make their earnings public was \$478,873,671.

# Arnold Report on Providence Transportation Conditions

Analysis of Service of the Rhode Island Company in the Largest City of the State, Prepared for a Committee of the Council—Co-operation of the Municipality Essential to Improvement in Schedules and Routing

An abstract of the preliminary report of Bion J. Arnold on transportation conditions in Providence, R. I., was published in the *ELECTRIC RAILWAY JOURNAL* of June 17, 1911, page 1069. The full report, as made to the joint committee on railroad franchises of the Providence City Council has now been issued.

### GENERAL CONDITIONS

In a preliminary general analysis of present conditions the report says:

"The present traffic investigation is the result of expiring franchises and a shortage in cars during the past winter, due to delayed deliveries from the builder; bad weather naturally aggravated the shortage difficulty. The company was forced to handle its winter traffic with a total of 365 cars, including reserve, operating in or into Providence. At the present time it has 415 cars available, an increase in actual seating capacity of nearly 20 per cent.

"It appears clear that the company has not kept fully abreast of the demand for new equipment. From 1902 to 1910 inclusive the revenue fares on the entire system increased 62 per cent, while the car equipment increased only 22 per cent. It is also true, however, that the conditions causing undue congestion within the loading district of the city are directly or indirectly responsible for a large share of the dissatisfaction expressed regarding the traction service. With the present limited trackage and extreme concentration of traffic along certain streets, adequate service can hardly be expected in Providence with any amount of equipment, for the reason that it is impossible to maintain a reasonable schedule speed and secure

tricts and of passenger movement at all points. Rapid car movement can only be brought about by thorough re-routing in the terminal district to equalize more logically the distribution of cars according to the available street capacity. This will require widened roadways, new tracks, extensions, new streets and a new terminal loop system centering in Exchange Place.

### EARNINGS PER CAPITA—RHODE ISLAND COMPANY SYSTEM.

Year	Earnings.	Population.	Earnings Per Capita.
1900	.....	359,944	.....
1903	\$2,584,453	*383,000	\$6.75
1905	3,242,972	407,171	7.97
1910	4,502,922	465,983	9.67
1915	*5,515,000	*515,000	*10.70
1920	*6,720,000	*569,000	*11.80
1925	*7,970,000	*620,000	*12.85

\*Estimated.

"These improvements cannot be carried out without the co-operation of the city and the acceptance by its citizens of reasonable recommendations for relief. The company seems to have been influenced in the past to adopt certain routings not calculated to serve the best interests of the city as a whole. But a broad-minded policy of re-routing should now be adopted to care for the future as well as the present. And it is especially important that the city should not be niggardly in its provisions for proper routing. The city has now reached a point where it has outgrown its streets without having exerted itself toward a general improvement.

### ELECTRIC AND STEAM SERVICE

"It is not a function of this report to consider the relations between electric and steam service, both of which are handled in Providence by the same corporation. It should be said, however, that even though both steam and electric lines are under one management, this fact by itself constitutes no valid reason for forcing an interchange of traffic desirable to the corporation but opposed by the patrons. The only way in which a corporation should accomplish a desired diversion of traffic from steam to electric lines or vice versa is not by curtailing the one, but by improving the other so greatly as to insure its immediate acceptance.

"The corporation is now in a position where the hostility of the public prevents it from asking for and executing improvements really needed and where operating conditions are officially sanctioned which would not be permitted against its better judgment under more fortunate relations. The essential thing for the corporation is to encourage increase in the riding habit. This can only be done by good service. Adequate service requires friendly co-operation between public and company.

"It cannot safely be assumed by the city that its co-operation in the matter of thoroughfare improvements will necessarily be reciprocated in the improved service anticipated to a proportionate degree. The only way in which the city can be assured that it is receiving the degree of service equivalent to its rightful expectations is by the systematic recording of service provided. It is firmly believed that the maintenance of such an official record would secure and perpetuate the relations desired between the company and the public by virtue of the positive character of the record."

The report then discusses the radial form in which the city has developed and the abuse of the transfer privilege

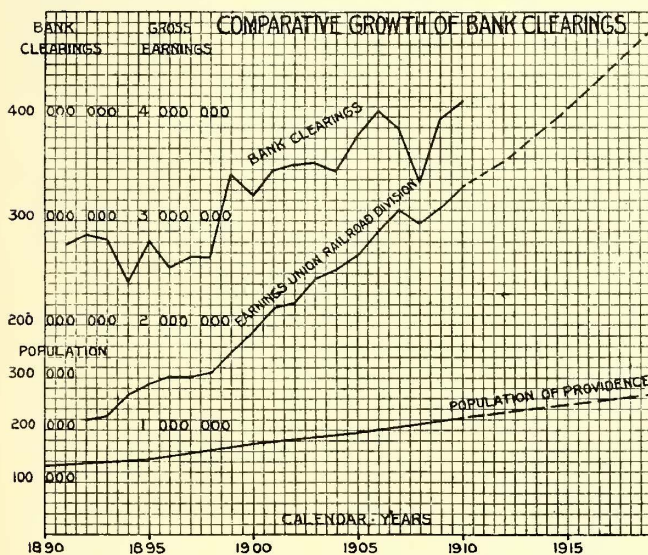


Fig. 1—Providence Report—Bank Clearings and Electric Railway Earnings

the proper mileage per car. The speed is further retarded within the city by the excessive number of stops. Absence of prepayment fare collection, short and constricted platforms, general absence of prompt movement on the part of both passengers and trainmen, constitute further retarding influences which should be improved. Much can be done by prompt, rigid dispatching and inspection.

"The most important factor in the present problem is increased speed of car movement through down-town dis-

which has arisen because of the absence of crosstown lines.

It is estimated that, barring territorial expansion or calamity, the population of the 5-cent fare zone, which is larger than the limits of Providence, will increase from 286,000 at present to 386,000 persons in 1925. The entire district tributary to the Rhode Island Company lines at present has a population of 465,000. Referring to the relation of bank clearings and electric railway earnings the report says:

"Starting with 1898, when commercial prosperity was resumed after a prolonged depression, the clearings increased by irregular steps from \$226,000,000 to \$415,000,000—156 per cent. During the same period, traction earnings increased from \$1,550,000 to \$3,315,000 or 112.5 per cent. Thus for 1898 the earnings represented 0.58 per cent of the clearings; in 1910, 0.8 per cent. This means that the railway company earned \$1.00 for every \$172 clearings

trenchment seems justifiable for the year 1908. It is apparent that the company did not accurately anticipate the demands of the increase in traffic that took place thereafter; in other words, it is now about one and one-half years behind in car equipment. Between 1903 and 1907 the passenger traffic increased 43 per cent, the car equipment 21 per cent; by 1910 the increase in traffic had distanced the equipment by 62 per cent, or nearly three times.

"The total gross earnings increased steadily from 1893 up to the slump of 1907-08. In the track mileage a sharp increase occurred in 1900, but the growth has been uniform since—31.31 miles in ten years, or 3.13 miles per year.

"Taking this last decade, the record shows an increase of 69.8 per cent in gross earnings (66 per cent for the city of Providence), and 26 per cent in trackage (20 per cent for the city) or 2.53 miles per year (1.48 miles for the city). In 1910 the proportion of the city mileage and earnings to the total mileage and earnings of the Union division was 72.4 per cent. This proportion has been increasing somewhat during the ten years, but has not increased materially since 1905.

"The single-track mileage in Providence for the past ten years has increased about as fast as the population of the district served, which indicates normal growth. The past three years, however, show a disposition to retrench in the matter of extensions, which, if continued, will sooner or later bring about unsatisfactory development of the city proper. Thus, in 1910 there were 3.95 miles of track per 10,000 persons; in 1900, 4.0 miles; in 1903, 4.5 miles approximately.

"Considering the Rhode Island System as a whole, for that portion of the State which it occupies, it is found that the earnings per capita approximate \$9.70 for the year 1910, and the ratio has increased rapidly since the company began operation in 1903, when they were only \$6.75 per capita.

"For the city of Providence only the earnings per capita have steadily increased, with the exception of a few fluctuations, from about \$6 in 1895 to \$8.55 in 1910. For the Union division district [the 5-cent fare district] the earnings appear to be relatively higher. Starting with \$11.57 per capita in 1910 the present 5-cent-fare zone will earn in 1925 over \$6,000,000 per year."

TERMINAL DISTRICT

All cars out-bound from the terminal district must pass through nine outlets. By observation at points of maximum load during the evening rush-hour, 5:30 p. m. to 6:30 p. m., the average loading was found to be 133.5 per cent of the seats furnished; i. e., 14,730 passengers and 11,036 seats, while the individual throats averaged 133 per cent, 118 per cent, 145 per cent, 141 per cent, 142 per cent, 143 per cent, 132 per cent, 147 per cent and 102 per cent respectively. The report adds that as a private check on the accuracy of these counts the company stationed inspectors at the same points and independently obtained very nearly the same results for the traffic as a whole. Thus, the average traffic of the nine throats was found to be 133.5 per cent of the seating capacity by the city's count and 128 per cent by the railway's. The report adds:

"An essential measure of service is the proportion of rush-hour to normal or non-rush-hour service. The company's schedule provides for 11 per cent more service during mid-day and 102 per cent more during rush hours than at normal hours. This is a condition for which the company is to be commended. The standard of double service at rush hours is admittedly good, and if adhered to, indicates the company's desire to justly meet all reasonable demands of rush-hour patrons.

"The company's method of assigning reasonable capacity of equipment during rush hours is to station inspectors at the various throats indicated. If on three successive days cars appear to be loaded beyond a certain limit, additional trippers are ordered into service, and vice versa."

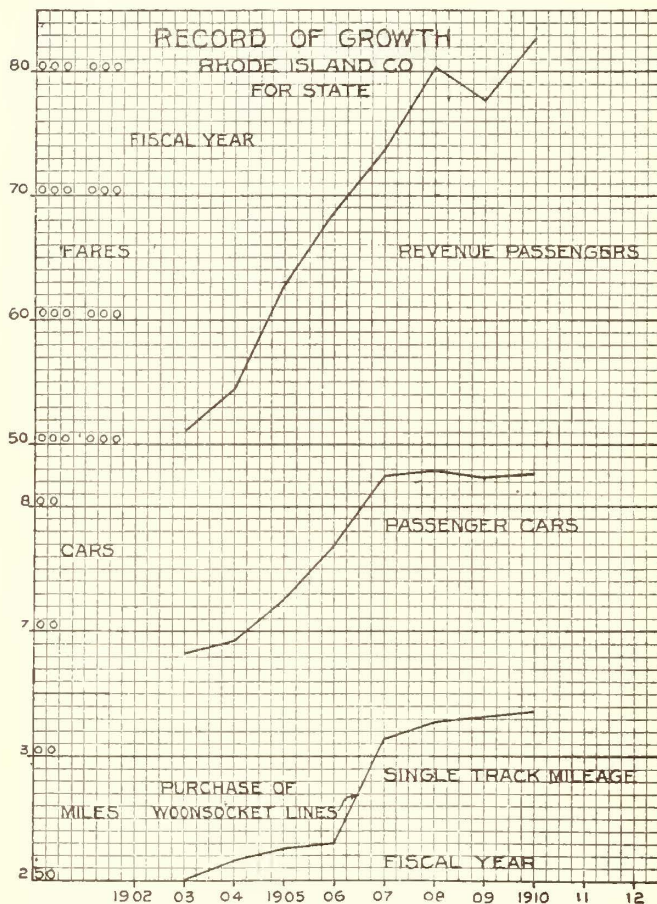


Fig. 2—Providence Report—Development of Rhode Island Company

in 1898 and \$125 in 1910, indicating that transportation in Providence is becoming more and more indispensable to the patrons and valuable to the company. The high level in Providence, and especially the growth, should be regarded as very encouraging."

THE RHODE ISLAND COMPANY

Taking up in detail the operations of the Rhode Island Company the report says:

"During 1907 the system was expanded by the acquisition of other properties. Neglecting this rise, the increase in trackage was 24.87 miles in six years, or 4.14 miles per year over the entire system.

"The passenger traffic suffered one severe slump in 1908-09. For the entire period of seven years, however, the total increase amounted to over 31,000,000 passengers—61.4 per cent—or 8.75 per cent per year average. The record of equipment shows an abrupt halt since 1907, after a steady increase for three or four years previous. However, considering the slump in traffic in 1907-08, this re-

SERVICE REQUIREMENTS

For the purpose of discussion 70 per cent was assumed as the proper operating ratio, including taxes and also annual payments into a depreciation reserve fund. For 1910 the earnings in the Union division, the 5-cent-fare zone, amounted to \$3,315,149. Assuming car mile earnings of 30 cents for the division and total operating expense of 21 cents per car mile, the report adds that the company should have operated approximately 11,050,000 car miles per year. In 1910 the company operated 9,427,787 car miles. The report adds:

"Since 1907 the car mileage not only has not increased, but has actually decreased up to June 30, 1910. Unquestionably, the records for the fiscal year of 1911 will show an improvement due to the addition of the fifty forty-two-seat cars. Whereas during the three years mentioned the total passenger traffic increased 6.75 per cent, the car mileage decreased 1.1 per cent. As no new equipment was put in operation during this period on the Rhode Island system, there still may have been some shifting of equipment from other divisions to Providence.

"It was, therefore, incumbent upon the company to increase its car mileage at least 1,622,300 car miles, or 17.2 per cent for the calendar year 1910. It is only just, however, to point out distinctly that this does not mean a proportionate increase in equipment, necessarily; for with faster schedule speed secured by improved thoroughfares contemplated in this report a large increase in car mileage will be possible with the present equipment.

"For the year 1911, assuming no improvement in faster schedules is made, an increase of about 10 per cent in car mileage would be warranted, judging by the steady growth in traffic since 1898.

"The present density of service in car miles per mile of single track (per year) averages for the entire 5-cent-fare zone 61,800 per mile. This is no doubt due somewhat to the low average speed.

"In 1910 the earnings of the Union division averaged \$21,740 per mile of track, slightly greater than in 1907, but about the same as for the past fifteen years. For the entire Rhode Island system the earnings averaged \$14,200 per mile in 1910. Both ratios compare favorably with other railway systems of similar character."

GENERAL SERVICE IMPROVEMENTS

Under this heading the report treats first of schedule speed, the average of which in the city and immediate suburbs is 7.96 m.p.h. from terminus to terminus. Counting from a point outside the congested district where reasonably unhampered operation begins the average is 8.71 m.p.h. Maximum speed is limited by city ordinances to 6 m.p.h. in the congested district and from 9 m.p.h. to 12 m.p.h. elsewhere. As stops alone consume from 15 per cent to 30 per cent of the time in normal operation and acceleration and retardation perhaps 50 per cent of the balance, the best schedule speed possible would not be over 5 m.p.h. Schedules could be made satisfactory to patrons only by violation of these ordinance requirements. Observations showed that, except on certain suburban lines, the average running speed, exclusive of stops, did not exceed 10 m.p.h. It is recommended that cars be permitted at least the same latitude of running speed as ordinary vehicles, which are allowed 15 m.p.h.

The average interval between white stopping posts within the settled limits of the city and immediate suburbs is approximately 250 ft. It is suggested that these be fixed at least 500 ft. apart except in the congested district where street intersection stopping points should be maintained. Car interference at street intersections should be avoided. The use of automatic signals, inaugurated by the company last year, is commended.

It is recommended that electric switches be installed at all important intersections, at least within the loading districts.

Owing to the narrow streets in the downtown district the report says that the city should regulate the width of extraordinary vehicles or confine them to certain streets during certain hours. Cars should be given the right of way, next to fire, police and hospital equipment, and suitable penalties should be provided for fractious drivers.

Two or three cars should be permitted to stop and load simultaneously at the same corner. Cars are not allowed by present rules to run closer than 30 ft.

The transfer traffic averaged less than 19 per cent on the Union division in 1910 and it had increased by only a small margin since 1907.

Regarding double-tracking the report says: "To illustrate the limitations, a five-minute headway may be used. For eighteen-hour operation, this corresponds to an annual total of 114,000 car miles per mile of track. Up to this point single track can be operated effectively with the proper number of turn-outs for accommodating the headway, but as a general rule, when necessary turn-outs are more frequent than three per mile, or 1750 ft., corresponding to an average of 2.5 minutes headway, double-tracking becomes advisable."

If separate routes could be found for the suburban ex-

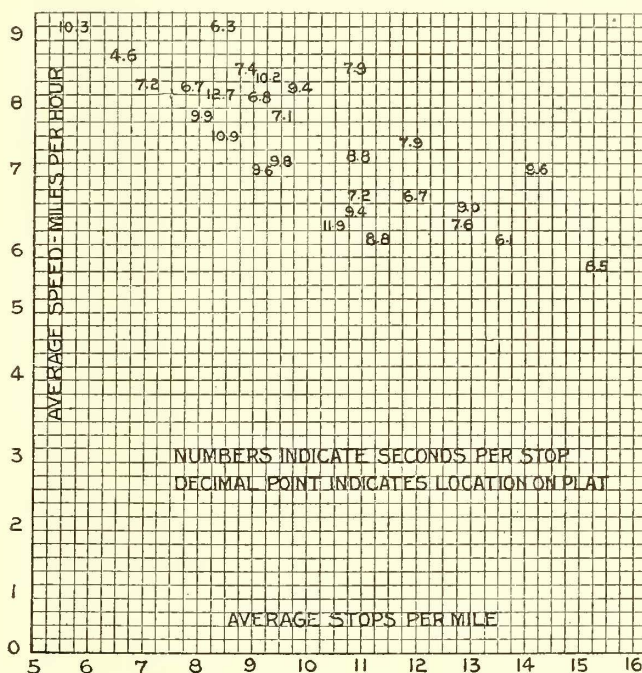


Fig. 3—Providence Report—Reduction of Speed with Stops

press cars their adoption is recommended. Local business, however, need not be accepted on express cars. Electric freight cars should not be operated on main line thoroughfares at times of heaviest street traffic.

GENERAL IMPROVEMENTS IN PLANT AND EQUIPMENT

On the subject of tracks the report says that, in general, the permanent way is fairly well constructed and maintained, especially on lines of heavy travel.

In reference to the cars the report says in part: "The most serious objection to the design of rolling stock may be found in the short and narrow vestibules which universally exist. The present narrow vestibules on the new cars have resulted from the necessity of securing as great a seating capacity as possible in the car body, and the ordinances limiting car dimensions to 43 ft. overall, but it is difficult to see why the narrow vestibules were necessitated upon the thirty-four-seat class, except as a matter of tradition. Complicated by the single entrance principle, the construction problem becomes all the more acute as the car body increases in capacity."

It is strongly recommended that the prepayment type of car be adopted immediately.

The result of preliminary studies of the car question is summarized as follows, assuming the present platforms replaced by prepayment platforms:

Car body—present Bradley body 31 ft. over corner posts; width over drip rail, 8 ft.  $7\frac{1}{2}$  in.

Platforms—prepayment 6 ft. 6 in. overall, tapered to 6 ft. 6 in. width at bumpers.

Truck centers—same as at present, 19 ft. 6 in., four motors.

Typical designs of cars and of a proposed car are submitted. The alternatives in regard to the present equipment are stated as follows:

"First, retain the present Bradley car with platform, and pass all passengers in at the rear and out at the front, for double-ended operation; second, same as above, except clear rear platform for single-ended operation; third, retain front platform with bulkhead and extend rear platform to prepayment, single-ended operation; fourth, re-

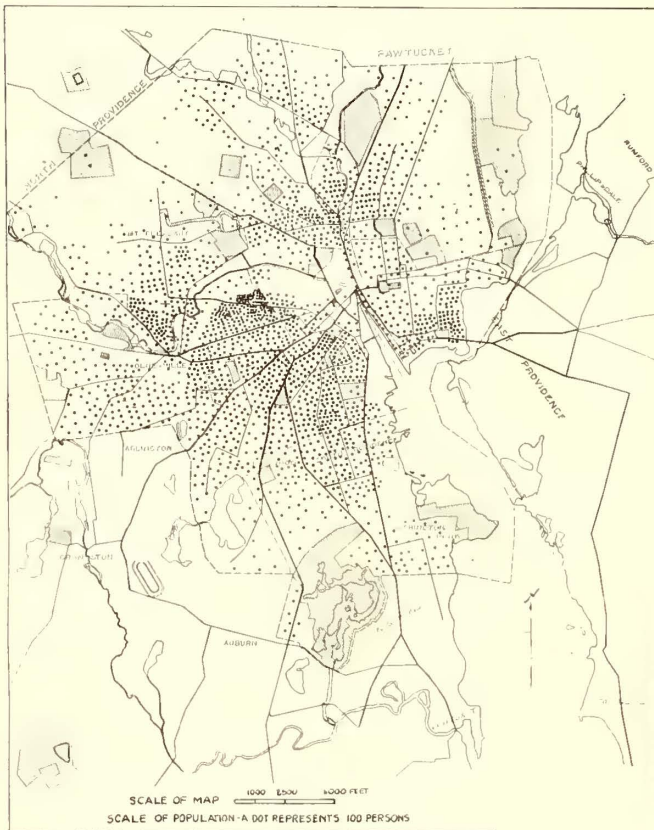


Fig. 4—Providence Report—Population Chart

move both bulkheads and install folding doors and steps operated by the conductor; fifth, extend both platforms and remove both bulkheads, double-ended operation; sixth, same as the fifth, except for single-ended operation.

"The first could only be regarded as a makeshift. The second little better than one. The third and fourth would be a considerable improvement. The fifth and sixth, a great improvement.

"The cost of these changes would be about as follows: By using the 'pay-as-you-enter' plan with center bulkheads with split corner posts and using the present doors, about \$425 per platform; removing the bulkheads entirely and using four-leaf folding doors on the 'pay-within' plan, the cost would be about \$500 per platform. In each case the canopy would be spliced and the platform sills reinforced by steel angle stiffeners."

It is recommended that the semi-convertible feature be incorporated in future prepayment equipment.

#### CARHOUSE STANDARDS

On this point the report says in part:

"By the company's statement, every car on its system is run in every 500 miles for thorough inspection of trucks,

motors, trolley stands, brakes, controllers, etc. Gear cases are opened twice a month. Cars are swept and dusted, windows washed and commutators sanded each daily run-in. The entire body is washed each 500 miles turn-in. Car bodies are painted every two seasons and varnished every season. A 500-mile turn-in in regular service corresponds to about three and one-half days interval, or on some lines twenty round trips.

"The standard is fairly reasonable if maintained, although the standard in some other cities is better. The facilities at the more modern barns would unquestionably make it possible of attainment, but there is little doubt that from lack of equal facilities at older barns, and the evident condition of the cars as sent out each day from these particular barns the standard is not maintained."

#### RE-ROUTING

This section takes up first the question of re-routing in the terminal loading district and expresses certain principles, in part as follows:

"Long-haul routes are best suited to looping at central terminals.

"Short-haul routes having equal or multiple headway may be connected so as to secure the most direct route through the city.

"Long-haul suburban lines should use the shortest possible loops just outside the congested center.

"Short-haul loop lines should use the loops which pass through or around the retail district.

"Permit only straight-away crossings instead of branch-offs at seriously congested street intersections.

"Use no transverse street to close a loop that has not sufficient capacity for absorbing a 5-minute accumulation of cars without interfering with traffic on main intersecting streets.

"Branch-off to the right on out-bound track, not to the left against the flow of in-bound tracks.

"Avoid crossed or figure eight loop; keep the throat open if possible.

"Avoid counterflow operations at all junctions of single track with main line.

"Double-track on parallel or alternative streets on lines of heavy traffic, at least outside of the loading district.

"Provide independent routes for single-track lines except all cars moving in one direction.

"Determine the ultimate capacity of present streets in order to plan for the future.

"Business and private interests must not be allowed to unduly influence the assignment of routing to specified streets.

"A walk of one block from any point to a desired car line is within the bounds of good service for any business house if necessary for an adequate re-routing scheme."

Observations at one point showed that cars passed in one direction during the rush hour at an average headway of 40 seconds and required  $13\frac{1}{2}$  seconds per stop. However, the minimum headway was frequently less and the delay in loading greater so that congestion occurred. At various other loading points downtown the average time observed per stop was 8.7 seconds.

Alternative plans for re-routing are suggested. It is also regarded as essential that the city permit tracks to be laid in certain down-town streets for the sole purpose of emergency routing.

#### REDISTRIBUTION OF OUTLYING SERVICE

This problem is stated to resolve itself into certain basic questions, assuming an increase of 1,622,000 car miles per year to be distributed equitably over the system. These questions are, in part, as follows:

"Will short-haul extras relieve long-haul cars?"

"Will a split headway or 'double-header' tripper best serve rush-hour load?"

"Are limited-stop expresses necessary to reserve sufficient long-haul seats?"



"Should express stops be limited during rush hours only?"

On many of the longer outlying lines the average ride is stated to be from 4 miles to 7 miles and generally the loading upon these lines is about as heavy as on the city lines. This results in a standing load often exceeding 5 miles. The report says that less standing should be permitted on these long-haul lines than on short-haul city lines for the reason that persons do not object to standing for a short distance, while a standing trip of thirty to forty minutes is extremely fatiguing. The report then says:

"The average passenger haul over the lines of the Union division was determined by passenger counts as 2.07 miles. This is low, as much as 30 per cent below some cities. It appears from the records that the long-haul suburban routes earn per seat-mile not much less than the short-haul routes and average what would be a fair earning capacity for the entire system, 30 cents per standard car mile, or 0.7 cent per seat mile."

of at least 10 m.p.h. or 12 m.p.h. on free running lines. This would raise the average schedule speed, including stops, to 8.5 m.p.h. or 9 m.p.h.

EXPLANATION OF ENGRAVINGS

Fig. 1, published on page 315, compares the relative increases in earnings of the Union Railroad division and of bank clearings in Providence.

Fig. 2, published on page 316, shows the relative growth of passenger traffic, track mileage and rolling stock of the Rhode Island Company within the State for the last seven years. The figures are for the fiscal years ended June 30.

Fig. 3, published on page 317, illustrates from a large number of observations in Providence how the speed is decreased rapidly with an increased number of stops per mile. The figures indicate the average duration of stops and vary but little, showing that reduced speed is due largely to frequency of stops outside of the business district.

Fig. 4, published on page 318, shows by means of dots, each representing 100 persons, the actual distribution of population throughout Providence, based on the 129 enumerating districts of the 1910 census.

Fig. 5, shown on this page, is an analysis of the law of increased earnings. This diagram shows graphically that, based upon the last thirty years, earnings in Providence are increasing as the 1.9th power of the population, i. e., nearly as the square—a result which has already been developed from a study of the fifteen larger cities of the United States. This law means that when the population doubles earnings will quadruple. The dotted line indicates this law of the square. A line parallel thereto must conform to the same law, which is practically the case for Providence.

NEW COMPANY BUILDING IN PORTLAND, ORE.

A reinforced-concrete building, fully fireproof, is being constructed at the corner of East Water and Hawthorne Streets, Portland, Ore., for the Portland Railway, Light & Power Company, which is to be used as a combination warehouse and clubhouse for the corporation's employees. The building will cost between \$60,000 and \$70,000 and will occupy ground space 100 ft. x 200 ft. and will be four stories high.

The construction of this building is along the lines of the company's plans to give its employees opportunities for associating together and for developing a spirit of co-operation. Not only is the building to contain clubrooms for the light and power employees, but it is also to be the office headquarters for the transmission department of the interurban lines of the company. In the basement is to be located a garage for the company automobiles. In addition, space is to be provided for heavy line and underground material, such as cables, transformers, reels, wire and conduits.

The first floor will be the general headquarters for the line department. Here also will be the headquarters for the Oregon Water Power System, the train dispatcher and the trainmaster's department.

A large part of the second floor will be devoted to the clubrooms for the employees. It is planned to equip the rooms with gymnasium apparatus, shower baths, pool and billiard tables, reading room and a technical library for the exclusive use of the 1000 or more employees. The Light and Power Beneficial Association will have its headquarters in these rooms, and will, in a measure take charge of the activities. On this floor will also be the meter department. About one-half of the area will be used for this branch of the company.

Progress is being made on the structure, and it is expected that it will be completed and ready for use before Sept. 1.

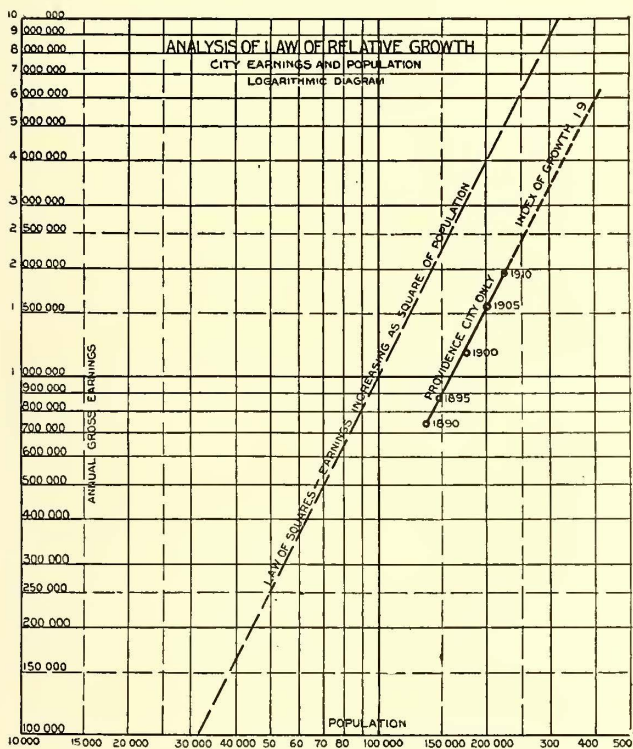


Fig. 5—Providence Report—Analysis of Law of Increased Earnings

In a discussion of the number of stops, the report says that "from 15 per cent to 30 per cent of the time is consumed in normal stops, the longer periods occurring on those lines where advantage is taken of the frequent pole stops or else where the delays are excessive due to over-crowding. The average length of stops varies from six to fourteen seconds, the latter on over-crowded lines. Attention must, therefore, be directed to: First, a reduction in the possible number of stops; second, a reduction in the delays from over-crowding; third, a reduction in the delays due to lack of promptness in handling of cars en route, exclusive of unavoidable delays in the terminal district."

For the entire Union division the dead mileage was 4.48 per cent, or, excluding suburban lines, 2.93 per cent.

The Rhode Island Company is distinctly commended for the establishment of many through routes.

In order to ascertain if possible the existence of communities of interest, not indicated by the traffic counts on present routes, a canvass of several large manufacturing establishments was made.

SPECIFIC RECOMMENDATIONS

These include an average speed, deducting time of stops,

## CIVIC FEDERATION COMMITTEE REPORT ON REGULATION

The subcommittee on plan and scope of the department on regulation of interstate and municipal utilities organized by the National Civic Federation has made a preliminary report. The committee is composed of the following: Emerson McMillin, M. S. Decker, John H. Gray, Franklin K. Lane, Franklin Q. Brown, P. H. Morrissey and Milo R. Maltbie.

The committee starts with the premises that it is taken for granted that government regulation of some kind and character is essential. The recommendations made relate, therefore, to the general field to be covered and the organization to be provided. In part the report says:

"These utilities, which now represent investments of millions and millions of dollars throughout the United States, are vital to the growth and development of the country and the well-being of our cities. Various authorities have granted to public service corporations extraordinary and far-reaching powers. The acceptance of these special and important powers carries with it duties and obligations from which the individual and the ordinary corporations are entirely free.

"The nature and character of these public services tend to make them monopolistic.

"Uncontrolled monopoly not only contains elements of danger to the public, but sometimes leads to stagnation and inefficiency, which, reacting, are harmful to the public and may prevent the development of a community or a nation. A proper system of public regulation should, therefore, not only protect the interests of the public, but should provide a means whereby initiative and enterprise may receive proper reward and encouragement, while securing to the public upon the other hand proper service at reasonable rates.

"Your committee believes that the utilities to be considered by the national committee should include the principal services, namely, transportation—steam and electric—communication, lighting and water. It does not believe, however, that any absolute limit should be fixed, for there have been interesting experiments in the control of other utilities, and it may be found very desirable to have such experiments investigated and considered in the preparation of the final report. Furthermore, if model statutes are to be prepared, one of the important points to be decided will be what utilities should be regulated.

"The time seems ripe for full investigation and thorough discussion of the various plans of governmental regulation. All concede that these public agencies must be effectively controlled. Few conceive as yet that such supervision and control may proceed so far through legislative action and growth of administrative authority along independent lines in each of the states, and as between the states and the nation that the results will be not merely incongruous but damaging to the interests of commerce, thus tending to defeat the underlying reason for transportation regulation, and that this can be avoided only by the attainment of general uniformity in statutory provisions and methods of administration.

"It is recommended that investigation should be made into the principal methods that have been tried in the United States and Europe, particularly Great Britain. For instance, the laws enacted in New York and Wisconsin within a few years, and the results of the regulation provided for therein, should be considered. Likewise the experience of Massachusetts, which was the first State to attempt to control in any broad way the public utilities other than railroads. The results of the operation of the Texas law would be interesting and profitable. The recent experience of such states as Virginia, Nebraska and Tennessee would be illuminating.

"Your committee also believes that a most useful function will be the preparation in outline of a statute pro-

viding for public regulation and the organization to carry it into effect.

"To carry forward the work, your committee recommends the appointment by the president of the National Civic Federation of an executive committee of nine to supervise the various investigations which are to be made, to determine the precise subjects to be investigated, to appoint sub-committees upon the various phases of the subject, to provide the necessary means for the conduct of the work, and to employ and direct all experts and investigators.

"Without intending to limit the functions of the executive committee or to determine what that committee should do, we consider that at least the following committees should be appointed by the executive committee, and that, so far as practicable, members of the executive committee should be chairmen of such sub-committees: (a) Regulation of rates; (b) control of service; (c) control of accounts and reports; (d) regulation of financial matters; (e) conflicts of jurisdiction; (f) control over labor questions; (g) legal and legislative; (h) committee on ways and means."

## DES MOINES STRIKE SITUATION

Trainmen of the Des Moines (Ia.) City Railway have submitted a copy of a proposed new agreement to J. R. Harrigan, general manager of the company. A vote upon the text of the agreement has been taken by the trainmen and it is now before the company for consideration. It is stated that the proposed contract has no direct bearing on the case of Conductor B. L. Hiatt, whose discharge was followed by the strike of Aug. 5.

The section of the proposed new contract relating to discharge provides that if a suspension is sustained by the general manager, or general manager and superintendent, or either of them, and the employee feels himself aggrieved by the action of the officer or officers he may take up the matter with the association for adjustment.

Concerning arbitration, the new contract provides that if any question arises which cannot be adjusted by the company officers or association officers the question shall be arbitrated by a board of arbitration.

A formal statement has been made by Guernsey, Parker & Miller, counsel for the Des Moines City Railway, stating that the company is willing to defer the hearing upon the motion to dissolve the injunction until after the State fair. It was stated that the company was not unmindful of the near approach of the exposition and of the importance of uninterrupted street railway service during the fair. The statement also declared that counsel for the company did not pretend to have discovered any new legal principles, but that the company will stand squarely upon its rights arising out of the facts in the case and out of the guarantees contained in the constitutions of the State of Iowa and of the United States which "though venerable, seem at times to be overlooked."

## HEARING ON SIDE DOORS ON LOCAL TRAINS IN NEW YORK SUBWAY

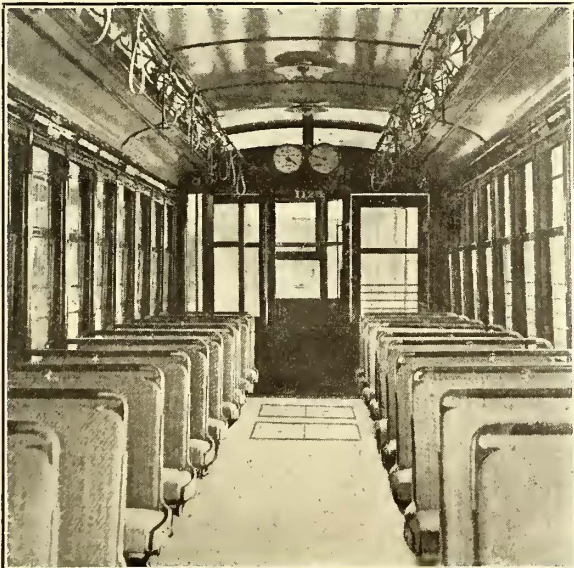
A hearing was held before Commissioner Eustis of the New York Public Service Commission of the First District on Aug. 16 to determine whether or not the Interborough Rapid Transit Company should be ordered to install center sliding doors in all the local trains of the subway service. Express trains are already equipped with this type of door. George Keegan, assistant to the vice-president and general manager of the company, declared that the company was perfectly willing to equip its cars without an official order. He said that the board of directors had already appropriated \$530,000 necessary for the improvements and the work would proceed at once.

## PLANS FOR RUNNING ILLINOIS TRACTION PRIVATE CAR TO CEDAR POINT CONVENTION

H. E. Chubbuck, general manager Illinois Traction System, is endeavoring to learn whether it would be possible for him to take a party of officials of his company and invited guests in his private car from Danville, Ill., to the meeting of the Central Electric Railway Association at Cedar Point, Ohio. The principal question to be considered is that of clearances. It was found that the private car could be operated over all the intermediate electric lines except on one street in Ft. Wayne, where the clearance would be insufficient to pass an opposing city car. It has therefore been proposed to have Mr. Chubbuck's car reach this street at a time when the tracks can be kept free of opposing city cars. Mr. Chubbuck furnished blue prints of the wheel tread and flanges of his car to E. F. Peck, president of the Central Electric Railway Association, to enable the latter to anticipate all track-work problems en route. A part of the proposed schedule follows: Leave Indianapolis at 7 a. m. Tuesday, Aug. 22; reach Ft. Wayne, 11:50 a. m.; arrive Lima, 1:55 p. m.; leave Lima, 2:15 p. m.; arrive Sandusky, 5:35 p. m. Mr. Peck's object in having Mr. Chubbuck's car reach Indianapolis Monday afternoon or evening is to have men available to take off the trolley hold-down hook and reduce the height of the smoke jacks if such work should be found necessary.

## SANITARY CAR FLOORING

During January, 1911, the United Railways Company, of St. Louis, installed in twenty-six new cars a sanitary flooring which as yet has indicated no appreciable wear. This material is stated to be non-absorbent and a non-conductor of heat, cold and electricity. It is so elastic that it possesses the resiliency of linoleum. The compressive strength of this flooring is 1730 lb. per square inch. Its fireproof qualities were demonstrated by a test

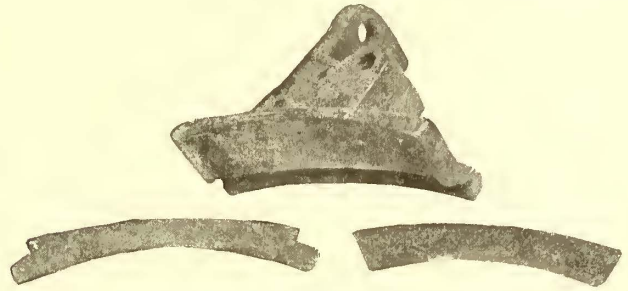


Sanitary Flooring in St. Louis Car

in which it failed to ignite at a temperature of 400 deg. Fahr. The accompanying illustration shows this flooring applied to one of the St. Louis cars. Its installation offered no difficulties, since this covering holds nails firmly and does not crack or splinter. It can also be applied to stucco work, moldings, imitation marble, etc. This material is made under the name of "Hy-ge-nia" by the National Hygienic Floor Company, St. Louis, which has absorbed the original maker, the Chemical Floor & Tile Company.

## REMOVABLE BRAKE SHOE AND HOLDER

The Malcolm Brake Shoe Company, Charleston, W. Va., is introducing in the electric railway field a new type of brake shoe holder and removable brake shoe which, it is claimed, reduces the weight of scrap shoes to 2 lb. or less. The holder is made in one piece and no keys, bolts or other loose parts are required to fasten the shoe in the holder. The face of the holder is curved to a larger radius than the face of the wheel and the ends have beveled lugs or



Removable Brake Shoes and Holder

dovetails formed on them to hold the shoe in place. To insert a new shoe the brake rigging is slacked off sufficiently to allow the shoe to be slipped over the wheel flange from the inside. The shoes are made to fit loosely in the dovetail of the holder so that they are easily and quickly applied, and the play of the shoe in the holder is quickly taken up by the accumulation of sand and dirt that works into the joint.

The face and back of the shoe are made to different radii so that the ends are  $\frac{3}{8}$  in thicker than the center. When the shoe is worn through at the center the scrap consists of two thin wedges of metal. As the shoes are reversible they may be turned end for end if they wear unevenly. The holders are made to fit the brake rigging of any type of electric car truck. In addition to the iron brake shoes the manufacturers are prepared to furnish carborundum blocks for use in truing up wheels.

## TEST CASE ON BRAKES IN OHIO

After a conference with representatives of forty street and interurban railway companies, held on Aug. 7, the Ohio Public Service Commission has decided to have a test case brought against one of the companies to compel it to equip its cars with brakes which will operate automatically to reduce the pressure on the wheels as the speed of the car slackens. Officials of the roads stated that they could not secure equipment to operate in that way and the members of the commission are inclined to agree with them, as they have seen nothing of the kind. At the same time the commissioners feel that a test should be made in order that the question may be settled. It is estimated that 85 per cent of the street and interurban cars in the State are equipped with either air or other power brakes.

Another section of the German State railways which is to be converted to electric traction is a group of lines in Silesia, near the frontier of Bohemia, including a line 76 miles in length, from Lauban to Königszelt, and certain branches aggregating about 90 miles. Much of this is mountainous country with heavy grades and sharp curves. The lines will work with a trolley pressure of 10,000 volts single-phase, 15 cycles, which is now the standard for the German main lines. Two types of locomotives will be used, one for passenger traffic capable of speeds up to 68.5 m.p.h. and the other for freight traffic similar to those for the Dessau-Bitterfeld section of the Prussian State Railways. These will be capable of speeds up to 40 m.p.h.

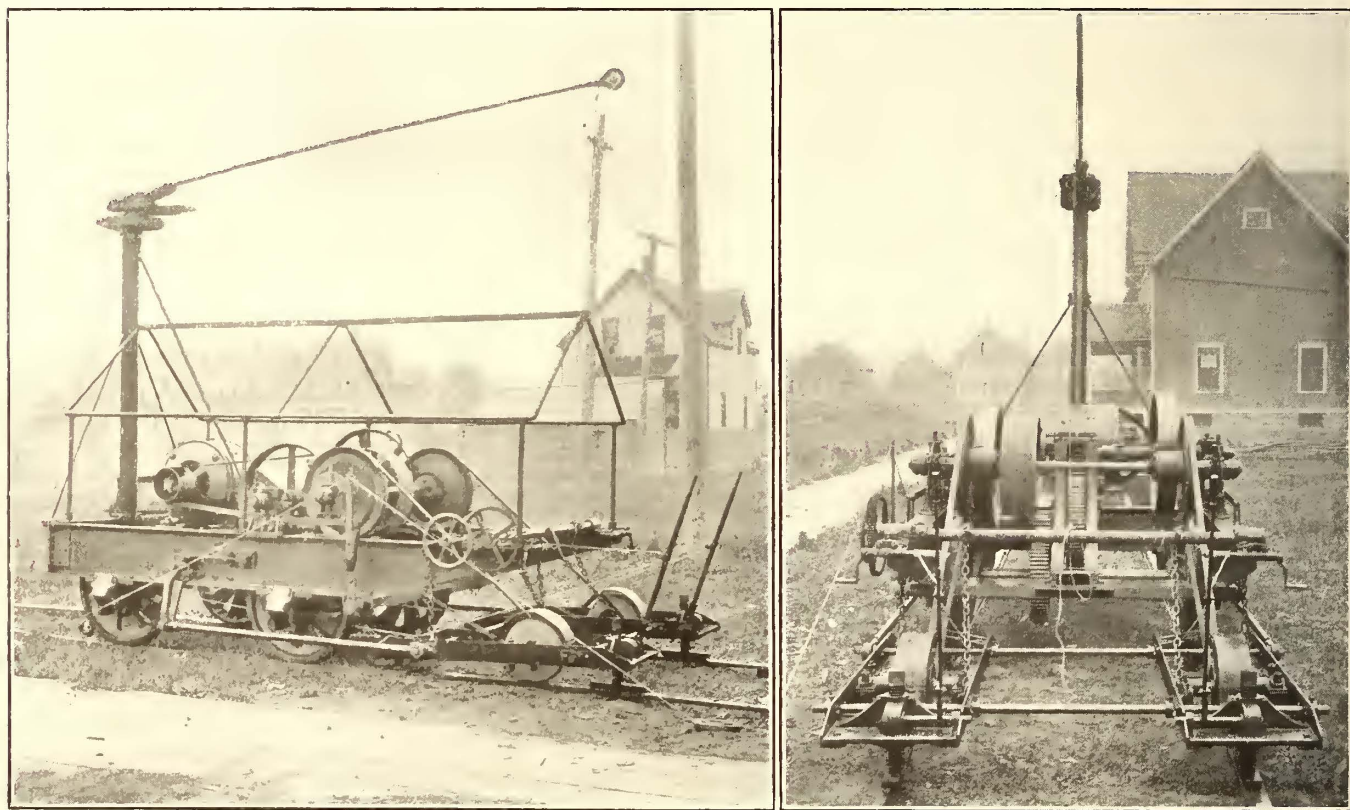
### KERWIN-DETROIT RAIL GRINDER

The Kerwin Machine Company, of Detroit, Mich., of which John Kerwin, superintendent of tracks Detroit United Railway, is an executive, has recently built and sold a number of machines for grinding track rails. By the use of these machines a number of railways have been able to extend the life of existing tracks for several years. In Detroit many miles of track so badly cupped at the joints that the rails had been condemned and ordered replaced were saved by the use of the rail grinder. The joint plates were first stepped so that the bottom of the cups on the receiving rails were brought to the level of the uninjured delivering rail. After the stepped joint plates had been tightened the Kerwin rail grinder was used and the cups were ground out of the receiving rail. The joints were thus brought to the surface of the track.

The rail grinder has other uses besides that of renewing old joints. It has been found profitable to grind new joints to a true surface because the tendency to batter and

The main framing of the grinding machine consists of two side sills, which are I-beams 15 in. deep and weighing 42 lb. to the foot. This frame is 13 ft. long over all. The end members are 15-in. 33-lb. channels and the intermediate cross-members are 12-in. 31.5-lb. I-beams and a 9-in. channel. The motor is mounted on a subframe built of 6-in. I-beams and covered with a  $\frac{3}{8}$ -in. plate, 38 in. x 29 $\frac{1}{4}$  in. in area. The trolley stand is made of extra heavy 5-in. pipe and is 7 ft. 6 in. high. Its base is bolted to the heavy end sill of the underframe and is guyed in three directions. The post fits over a casting which is bolted to the end sill so that a very secure support is given for the trolley base. With each rail grinder the manufacturer supplies a Bayonet trolley harp, stand and wheel.

The underframe of the rail grinder is supported on 4-in. street-car axles equipped with 33-in. 500-lb. standard street car wheels and journal boxes. This running gear permits the operation of the car at comparatively high speeds on long runs from one part of the railway system to another.



Rail Grinder—Side and End Views

cup is thereby delayed. Similarly, the grinding of special track-work rail heads, joints and hard centers is profitable because it improves the riding qualities of the track work and prolongs the life by removing any unevenness which may cause vibration and destruction of the rail head. Several of the larger city properties have purchased these rail grinders for removing corrugations from different classes of track work. The cost for grinding out corrugations is said to be from 1 $\frac{1}{2}$  cents to 2 $\frac{1}{4}$  cents per foot of rail according to the depth of the waves.

Accompanying engravings illustrate the appearance of the rail grinder arranged for operation. Briefly described it consists of a steel underframe mounted on four car wheels, a driving motor and a group of friction wheels and driving belts which operate emery wheels supported by a carriage which slides along the track rails. The machine is designed with a view to operating from one part of a railway system to another part under its own power, at which times the grinding-wheel carriage is raised clear of the track, as illustrated.

The motor, mounted on top of the frame, is used to move the car along the rails. Power from the motor is transmitted through a belt, friction pulleys and reduction gearing to a standard street railway split gear on one of the main axles. This gear is 23 in. in diameter and has a 4 $\frac{1}{2}$ -in. face and sixty-nine teeth of three pitch.

Friction clutches and other transmission mechanism are designed to provide either continuous movement of the car in either direction or a movement alternately back and forth over the short length of track or joint which is to be ground. Provision is also made for continuously driving the emery wheels while the car is moving forward and backward or letting them remain idle while the car is being moved from one end of the road to the other.

The transmission gearing may be described briefly as follows: A belt from the motor drives the upper or main shaft, shown in the end view of the grinder. This shaft carries two paper friction pulleys, each about 6 in. wide, and two larger pulleys which are fitted with narrow V-shaped belts for conveying power to the emery wheels.

Thus the grinding wheels are driven at high speed through the single intermediate shaft between them and the motor. The friction pulleys deliver power as desired for moving the grinder along the track. Two large iron pulleys are mounted with their journal boxes on guides so that they may be thrown against the small friction pulleys as desired. The shaft of each of the large friction pulleys con-

nects through a universal joint with the main train of gearing. One of the friction pulleys drives through a single intermediate pinion and the other through two pinions. Thus when the first friction pulley is transmitting power it will move the car in one direction, while the use of the other pulley with its train of two pinions will move the car in the opposite direction. One of the gears in the train leading from the pinions on the friction pulley shafts to the gear on the car axle is fitted with a clutch which permits the grinding wheels to be run while the car stands still.

The machine does its work automatically and but one man is required to set and operate it. A lever at the side of the frame controls the forward and backward movements. Two ropes with weights attached are usually employed to throw this lever at the end of the travel of the car. The reversing gear is so nicely adjusted that a pull of a few ounces only is required to operate it.

The carriage for the grinding wheels is made of angle irons tied together with rods. It is 5 ft. 10 in. long and is independent of the main frame of the car, except for the push rods, which are connected. Flexible connections in the grinding carriage remove the possibility of the smoothness of grinding being affected by any jarring of the car. The grinder rests on four 14-in. shoes which are adjustable for height by means of racks and pinions, which may be operated through direct levers or by means of small windlasses which wind rope levers on the adjusting lever. The levers are on the ends of the grinder frame.

The emery-wheel shafts have babbits to provide easy adjustment for various widths of track. As earlier stated, the emery wheels are independently driven at a constant speed irrespective of the movement of the machine along the track. Either emery wheel can be raised or lowered or moved forward or

back to grind staggered joints. The head of the rail is ground while the car is moving in either direction. The machine may be set so as simultaneously to grind a high joint on one rail and a low joint on the other rail and do its feeding automatically.

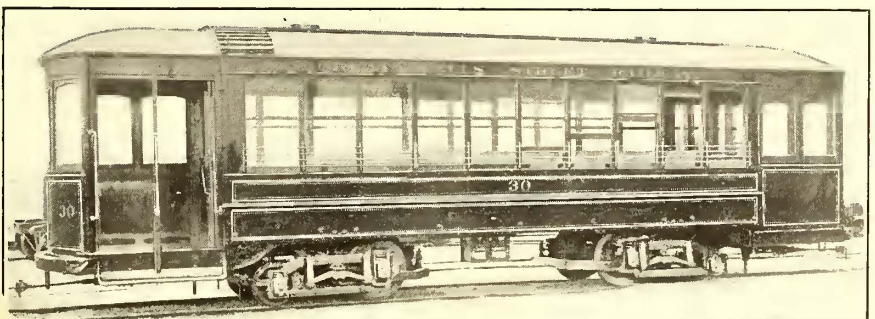
### CARS FOR GREAT FALLS, MONT.

The Danville Car Company has recently completed for the Great Falls (Mont.) Street Railway eight semi-convertible cars of the type shown in the accompanying illustration. The principal dimensions are the following: Length of car body over the end panels at the sill, 25 ft. 9 in.; length of the car body over the platform crown pieces or outside vestibule sheathing, 38 ft. 9 in.; width of the car at the sill, including the panels, 7 ft. 11½ in.; width of the carbody over the posts at the belt rail, 8 ft. 2 in. Mutually operating double sliding doors are provided at each end of the body. Both sashes of each window are arranged to slide into the roof.

The bottom framing consists of 4-in. x 7¾-in. yellow pine side sills plated with ¾-in. x 12-in. steel; 5¼-in. x 7¾-in. white oak end sills and center cross pieces of 3½-in. x 5⅞-in. white oak. The body framing has 3¾-in. corner posts and 3¼-in. side posts. The sweep of the posts is 1¾ in. Ash ribs, ⅝ in. x 1¾ in., are placed on the concave panels. They are mortised into the sills and fastened securely on the concave rails without screws. The center panel ribs, which are also ⅝ in. x 1¾ in., are mortised into the belt and concave rails. A sheath of No. 20 sheet steel is applied to form the bottom panel. The floor boards are of 13/16-in. narrow yellow pine covered with hardwood tapered floor mat strips, ⅝ in. at the top and ¾ in. at the bottom. The roof is of the Brill arch pattern without side ventilators. Three-ply birch veneer is used for the interior finish. Eight transverse reversible and two stationary longitudinal seats, all of rattan, seat forty persons.

Each platform is 6 ft. 6 in. long. The dashers are of No. 14 sheet steel and extend around one side, leaving step openings at the right-hand side facing the car; the dasher rail at the left-hand side is secured to the carbody. The vestibules are of the round-front type with a narrow center post to separate the entrance and exit step. The step openings are inclosed by folding doors, while the opposite closed side of the vestibule has two drop sash windows.

The cars are mounted on Brill No. 39-E single-motor trucks of 4-ft. 6-in. wheelbase, which will be operated over curves of 35-ft. radius. These trucks have 33-in. diameter



One of Eight Arch Roof Cars for Great Falls, Mont.

chilled-iron drivers and 21-in. ponies. The diameter of the driving axles is 4½ in. and of the pony axles 3⅞ in. Among other Brill specialties on these cars are fixed link drawbars, angle-iron buffers, sand boxes, signal bells and "Dedenda" pedal alarm gongs. These cars are also equipped with Peacock brakes, Hunter destination signs and Consolidated electric heaters. The approximate weight of the carbody, exclusive of the trucks, the motor and control equipment, etc., is 15,000 lb.

boxes designed for different emery wheel sizes. The emery wheel can be raised or lowered or moved forward or

**NEW TYPE OF STORAGE-BATTERY CAR**

The Federal Storage Battery Car Company has recently completed for the People's Electric Railway Company, Muskogee, Okla., the storage-battery car shown in the accompanying engravings. The car is designed for inter-urban service and possesses a number of very novel features of car construction as well as of electrical equipment. Hence its practical service on the Oklahoma line should be attended with interest. Several trial trips with this car have been run during the past two weeks over the tracks of the Erie Railroad from the shops of the Federal Storage Battery Car Company at Silver Lake, near West Orange, N. J. During these runs the car has shown a performance on level track at 24 m.p.h. of 600 watts per car mile.

The car body is 40 ft. 6 in. in length and has a width of 8 ft. 2 in. It is divided into three compartments; a baggage compartment which is 8 ft. in length with seats for four people, a smoking compartment with longitudinal seats for twelve passengers, and a main passenger compartment with ten stationary seats. Nine of these seat two passengers each and one seats four passengers. This longer seat and one of the shorter seats are near the entrance. The other eight seats are arranged back to back as cross seats. The car is

are protected from the heels of the passengers by perforated sheet-steel risers.

Every effort has been made to keep the weight of the car to a minimum, and the designers have succeeded in obtaining a weight of the complete car, including the battery, of 18,000 lb., and without the battery of 14,000 lb.

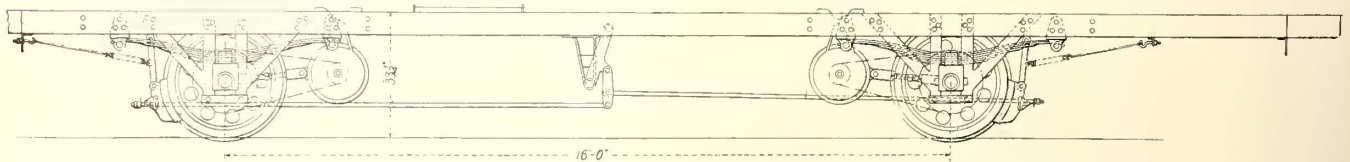
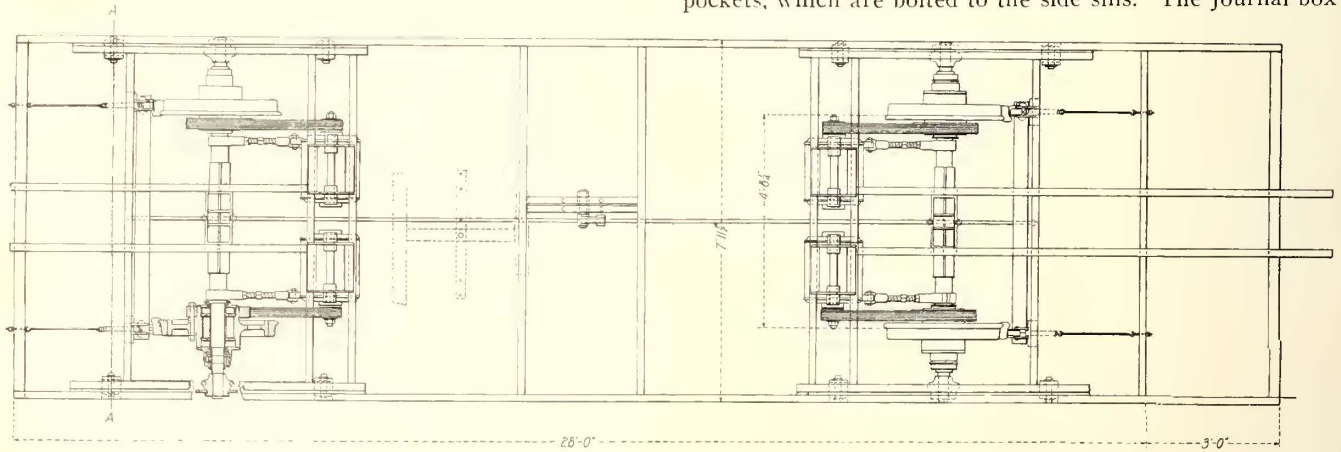
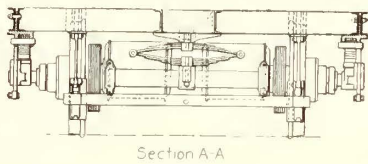
The floor frame of the car is entirely of steel. Each



Storage-Battery Car—Side View

side sill consists of two 6-in. channels bolted together. The end sills and the eight intermediate bridging pieces are also 6-in. channels. Two of these intermediate bridging pieces at each end of the car are used to support the motors which operate the car. Two 6-in. I-beams support the rear platform and two in the front support the front of the car.

An especially interesting feature of the construction is that no independent truck is used. Instead the car is supported on the car axles by the European type of running gear in which half elliptic springs, which rest on the journal boxes, support the car. These springs rest in pockets, which are bolted to the side sills. The journal box



Plan, Elevation and Section of Storage-Battery Car Floor Frame. The Sills Supporting the Rear Platform Are Not Shown

double-ended and the motorman's controller and brake handles are in the express baggage compartment at one end of the car and on the platform at the other end of the car. The roof is of the arch type with ventilators, and the batteries are located under the seats of the car where they

slides in pedestals, so that it has a free vertical movement, but none in a horizontal direction. The wheel base is 16 ft., but no difficulty has been experienced in operating the car around curves with as short a radius as 100 ft.

The axles are stationary and each wheel is independently

driven by a  $37\frac{1}{2}$ -amp, 250-volt motor, according to designs furnished by Messrs. Beach and Thresher, of the Federal Storage Battery Car Company, and Mallett, of the Diehl Manufacturing Company. The motor drive is with a Morse silent chain, and the speed reduction between motor pinion and wheel gear is about 3 to 1. Each wheel



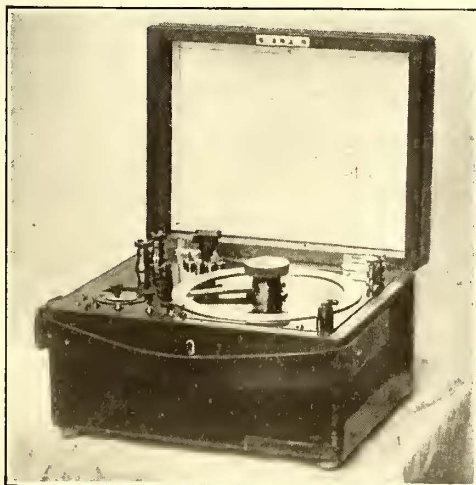
Interior of Storage-Battery Car

is mounted on roller bearings made by the Railway Roller Bearing Company, Syracuse, N. Y. Hand-brakes are used, operated by a lever near the controller. The wheels are steel tired and weigh about 250 lb. each.

The batteries are of the standard Edison battery A-6 type. The car is equipped with 200 cells.

### A NEW DIRECT-READING OHMMETER

The instrument shown in the accompanying illustration is an ohmmeter recently brought out by Queen & Company, Inc., Philadelphia, for the rapid and direct measurement of resistances which fall within the range of the slide wire or Wheatstone bridges to a commercial degree of accu-



Ohmmeter

racy. The manipulation consists of closing the battery and galvanometer keys and rotating the index until the galvanometer indicates a balance. The unknown resistance is then read from the scale without the necessity of referring to a table of values. To give maximum accuracy multipliers are provided so that a balance can be obtained

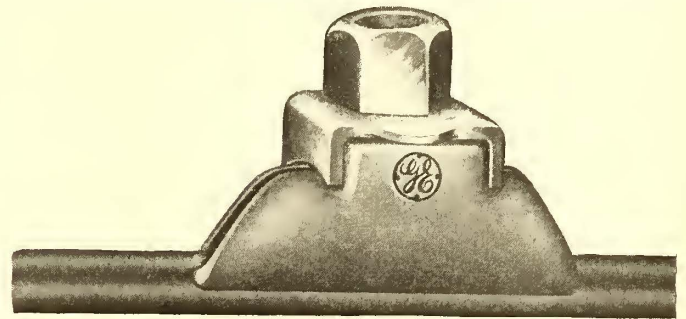
in the mid-part of the scales for all resistances ordinarily measured in actual practice.

A contained battery adapts it for portable purposes as well as bench use in manufacturing establishments and repair shops. The portable feature makes this instrument applicable for use in carhouses for checking resistances in the car circuits, etc. Provision is also made for connecting an external battery.

The scale is engine-divided on brass and is therefore not subject to the defacement of paper scales. The convenience of manipulation is very striking, since it is only necessary to rotate the index to balance. This feature adapts it for use by those not skilled in the use of Wheatstone bridges. The galvanometer in the ohmmeter is a sensitive D'Arsonval type as used in the portable testing sets of the manufacturers.

### A NEW TROLLEY EAR

The General Electric Company has recently placed on the market a new mechanical clamping ear, known as form M. It is made of forgings and punchings of steel, thus eliminating entirely such imperfections and variations as are common to iron castings. This feature also permits the use of small light sections of great mechanical strength and results in an ear which gives a maximum clearance from passing trolley wheels and a minimum height from the center of the wire to the top of the clamping nut. The jaws are duplicate drop forgings so that each lip should fit into the recesses of the trolley wire with abso-



New Trolley Ear

lute accuracy. The jaws are hinged by a steel pin located close to the wire and are of a length sufficient to utilize the maximum clamping effect produced by the clamping nut. The machine steel stud jacket engages shoulders on the clamps and fits into the hexagonal interior of the clamping nut. Thus by rotating the nut the stud jacket is drawn on to the suspension stud while the nut exerts an outward pressure on the upper outer edge of the jaws, which, by reason of the hinge, press against the trolley wire.

The punched washer is formed around the top of the jaws to prevent its turning while the clamping nut is being tightened. It is also provided with two small lugs which may be bent up against the side of the clamping nut, effectually preventing any possibility of the ear becoming loosened in service.

The new ear is made up to take round, grooved and figure 8 wire, and is furnished with either japanned or standard sherardized finish.

The form M ear, when used in connection with form H-3 suspension of the mining and ceiling type, renders possible an increase in head room of 1 in. to  $2\frac{1}{2}$  in.

The operators of the Glasgow, Scotland, municipal street railway declared a strike on Aug. 12. Attempts to operate cars by non-union men resulted in rioting in which several persons were killed and cars damaged.

# News of Electric Railways

## Addition to the Central Electric Railway Association Program

A. L. Neereamer, secretary-treasurer Central Electric Railway Association, has announced that in addition to the papers already scheduled for the meeting of the Central Electric Railway Association at Cedar Point, Ohio, next week, J. F. Keys, general passenger agent Detroit United Railway, is to present a paper on "Traffic."

## Hearing on Bay State Street Railway Improvements

The Massachusetts Board of Railroad Commissioners held a hearing on Aug. 15 on the petition of the Bay State Street Railway for the modification of the board's order for the double-tracking of Malden Street, between Paul Street, Malden, and Broadway, Revere, Mass. About a year ago the board suggested the desirability of this work, and recently the Malden board of aldermen passed a resolve asking for the construction of double-track on still more mileage.

Counsel for the company, Bentley W. Warren, in presenting the case, stated that estimates had been made of the cost of the two propositions, and that the roadmaster had estimated the cost of double-tracking the 17,500 ft. recommended by the Railroad Commission at \$72,363, and of the 4½ miles of track urged by the Malden aldermen at \$111,809. Mr. Warren stated that this line is used for the most part by tourists in summer making the trip to the beach at Revere, and that travel in the winter is light. He asked the commission to decide whether other improvements planned by the company were not needed much more than the double-tracking of this line.

As an alternative to the suggestions of the board Mr. Warren stated that the company proposed the following improvements:

1. To install United States automatic block signals in place of the present hand-thrown signals. Cost estimated at \$2,500.
2. To double-track the distance between two turnouts in Revere, 2775 ft., at an estimated cost of \$21,340.

G. H. Gray, superintendent of the division, testified that in his judgment these changes would remove the difficulties now experienced and that cars could then be operated without much delay, and with such frequency as the volume of travel warranted. They could be made at a saving of about \$75,000, as compared with the cost of double-tracking the whole distance.

Mr. Warren then outlined the improvements that have been asked by the public, in part ordered by the Legislature, and all considered desirable by the directors of the company, and planned to be carried into effect in the near future, as follows:

1. The abolition of grade crossings. The total cost of this work already planned would be \$645,500, in addition to which similar work will have to be done soon in other places.
2. A large amount of work is being done in placing wires underground; some is under way at the present time, and more is provided for by law. The estimated cost of this work is: In Brockton, \$110,000; Salem, \$60,000; Beverly, \$135,000. All this work is demanded by the public, though the company has opposed it on the ground that it could not afford it. The Legislature, in passing the special legislation, has taken the view that it is of first importance.
3. Rebuilding of bridges. Four bridge improvements were ordered by the last Legislature, involving a total expenditure by the company of \$121,250. In addition, there are other bridges that will require large expenditures in due time.
4. Extensions and double-tracking, which ought to be done, and which the company proposes to do. The total estimate for extensions and double-tracking is \$561,000.
5. Other necessities of pressing importance are these: Seventy-five new cars, \$450,000; development for express and freight-carrying service, \$450,000; improvements in

steam plants, in the Fall River central station, in the Salem station (new boilers and generator), in the Lynn station (new boilers) and in the Chelsea station (new boilers). The total cost is estimated at \$929,800.

To summarize, \$4,492,063 will be required to put the company's plant in prime condition to meet the permanent demands of business, most of which, counsel asserted, ought to be done before such work as the petition asks to have modified.

Mr. Warren stated that the gross receipts of the Northern division were 28.77 cents per car-mile. The operating expenses were 18.02 cents, and the fixed charges, including interest, taxes, etc., were 5.97 cents, making a total of 23.99 cents.

The cost to operate the whole division averaged 5.10 cents more per car-mile than the gross receipts of the Boston-Saugus Center line, which goes over part of the route under consideration, and 2.70 cents more per car-mile than the Malden-Revere line, which goes over part of the line under consideration.

George H. Gray said that the automatic signals would do much to remove the causes of delays, even if the line is not double-tracked.

Mr. Warren, in closing, urged that as between pleasure riding and regular business traffic, the latter should have first consideration. The board took the matter under advisement.

## Supreme Court Refuses to Restrain Work on New Subway in New York

Justice Ford rendered a decision on Aug. 16 in the New York State Supreme Court denying the motion brought by the Admiral Realty Company for an injunction restraining the Bradley Construction Company from building four sections of the proposed Lexington Avenue subway, and also enjoining the Public Service Commission and the Board of Estimate from authorizing the construction of the subway under these contracts. The decision of Justice Ford in part is as follows:

"Upon the argument I was inclined to the view that the changes in the specifications of the construction contracts between their advertisement and actual award might be of such a nature as to call for the intervention of this court, but a careful study of the excellent and exhaustive briefs submitted has brought me to the contrary view. Plaintiff has, in my opinion, failed to rebut the presumption that the public officials charged with the preparation, advertisement and awarding of the so-called Bradley contracts have acted throughout in good faith, and in compliance with the law. Indeed, there was not injected into the arguments or inserted in the briefs any suggestion reflecting upon the integrity or capacity of any public official.

"The graver question is the second. The seemingly contemplated guarantee of certain net earnings to a prospective bidder might, or might not, be either violative of the Constitution, or ultra vires of the municipal corporation. But I think that plaintiff's application for injunctive relief upon this branch of the case is premature. The proposed plan of operation with its prospective guarantee of net earnings could be held to imminently threaten irreparable damage to a taxpayer only on the assumption that the public authorities of the city intend to disregard the plain intent of the statute. After plaintiff appears and objects at the public hearing required by law to be held upon the proposed contract for operation—if indeed such a form of contract as the one in question is ever actually advertised for hearing—if the public authorities then persist in attempting to consummate it, an application for a restraining order might properly be entertained, but the possibility of such consummation, it seems to me, is as yet too remote to warrant the court's interference with the thus far lawful acts of public officials."

An appeal is likely to be taken to the Appellate division, but this cannot be brought until October, and there is nothing to prevent the Bradley Construction Company from going ahead with the work.



The argument on application of the Admiral Realty Company for an injunction was heard before Justice Ford in the Supreme Court on Aug. 9. Louis Marshall, who appeared for the Admiral Realty Company, asserted that it was impossible to separate the construction contracts granted to the Bradley Construction Company from the resolution by the Board of Estimate. Leroy T. Harkness, counsel for the Public Service Commission, argued that as it was impossible to grant a contract for operation to the Brooklyn Rapid Transit Company or any other concern without advertising for bids and public hearing, the court had no right now to consider what did not exist, but Justice Ford declared that what he could not get out of his mind was that the city was guaranteeing to the Brooklyn Rapid Transit Company a rate of dividends out of all proportion to the capital actually invested.

Permits were granted on Aug. 11 to the Bradley Construction Company, which has the contract for four sections of the new subway, to erect three more platforms and to sink the necessary shafts. These platforms will be at Lexington Avenue and Eighty-ninth, Ninety-seventh and 103d Streets.

Charles H. Peckworth, who was the lowest bidder for section 7 of the Lexington Avenue subway, will not go ahead with the contract awarded to him. The reason he has given to the Public Service Commission for refusing to undertake the work is the long delay which elapsed between the time his bid was made and the letting of the contract. Mr. Peckworth's bid for the section was \$2,750,463, while the Bradley Construction Company, the next lowest bidder, asked \$3,870,333 for the work. It has not yet been decided by the commission whether new bids will be advertised for or whether the contract will be given to the Bradley company.

#### Proposed Franchise Terms in Los Angeles

The ordinance prepared by the Board of Public Utilities of Los Angeles, Cal., and the city attorney to govern the granting of franchises in that city in the future has been reported to the City Council. It contains no reference to an "indeterminate franchise" provision, but it is understood that this plan will be advocated by the administration and that the people will be asked to vote on a charter amendment, when the new charter is framed, incorporating this in the basic law of the city.

The most important innovation is the provision that the franchise in each case shall be awarded to the person or firm making the highest bid, and that open bidding at a sort of municipal auction shall be allowed. These bids may be in a flat sum or in percentage of annual gross earnings.

The ordinance provides that no public service corporation shall use the streets without a franchise. It then proceeds to outline the machinery for granting franchises, including the provision that no franchise shall be granted until the application therefor shall have been referred to the Board of Public Utilities. The latter may recommend the terms on which the franchise shall be granted, and then the franchise must be advertised.

The second paragraph of Section 5 states that "the permit shall be awarded to the bidder offering the city during the life of the franchise the highest percentage of the gross annual receipts received from the use \* \* \* of the franchise, provided that such percentage shall not be less than 2 per cent of the gross annual receipts during the first five years, not less than 4 per cent during the next eight years, and not less than 5 per cent during the remaining period of the grant."

In case this amount is not deemed commensurate the Council may fix a minimum figure at which the franchise may be sold. In either case, after the bids are opened the highest bidder may be "raised" by the lower bidders, or by others, until the highest possible amount has been secured to the city, when the highest bidder shall receive the award.

The ordinance provides that all holders of railroad franchises in the city shall be compelled to exchange track privileges with others, for a reasonable rental.

Once sold, franchises cannot be transferred without the consent of the city. Work must begin within four months and be finished within three years. Parts of franchises

cannot be abandoned, and in case an entire piece of work under a franchise is abandoned the grantee must remove all his construction materials and put the street in its original condition. This abandonment must be approved by the Council.

So long as the City Council does not violate provisions of the charter it may take over the property of companies granted franchises by due process of law. The ordinance also reserves explicitly the right of the city to fix rates, fares and charges for service to be charged by the grantee of a franchise. In case a contention arises as to the exact meaning of any wording either of the ordinance itself or of advertisements, or of franchises granted, the ambiguity, says the ordinance, shall be construed in favor of the city.

#### Funds for the Investigation of the Chicago Terminal Electrification

The expense of the investigation of the feasibility of electrification of the Chicago steam railway terminals which is to be conducted by a committee of the Chicago Association of Commerce will be met by the railways concerned. The basis of division of the expense will be formulated by the General Managers Association. The active work of the committee will be conducted by the following: Horace G. Burt, chief engineer; Hugh Patterson, who has been connected with the Pennsylvania Railroad electrification in New York, electrical engineer; Louis H. Evans, formerly chief engineer of the Chicago Junction Railway, terminal engineer; Theodore H. Curtis, formerly superintendent of machinery for the Louisville & Nashville Railway, mechanical engineer.

#### New York Engineers Go Over Pittsburgh Subway Route.

—J. Forgie and A. Snyder, representing Jacobs & Davies, of New York, were shown over the proposed Pittsburgh, Pa., subway route by representatives of the City Council on Aug. 7.

**Another Subway Plan for San Francisco.**—John Pierce Hill, a civil engineer of San Francisco, has sent to the Board of Supervisors a communication outlining a plan for a subway for passenger traffic in San Francisco, commencing at the Ferry and extending up Market Street.

**San Francisco Indictments Quashed.**—In accordance with the order of the District Court of Appeals of California Superior Judge William P. Lawlor on Aug. 17 dismissed the indictments in the trolley bribery case against Patrick Calhoun, Terey L. Ford, Thornwell Mullally and William M. Abbott, officials of the United Railroads of San Francisco.

**Another Terminal Proposed for Cleveland.**—It is reported that options have been given on property on the south side of the Public Square to be used as a depot and terminal for steam and interurban roads. This project is different from the one announced some months ago, which, it is said, has not been abandoned. The properties involved in the two, however, are almost adjacent.

**New Jersey Commission Rules That Transfer Must Be Issued on Transfer.**—The Board of Public Utility Commissioners of New Jersey has rendered an opinion that the Public Service Railway must issue transfers on all intersecting and connecting trolley lines in Newark. This, according to the board, must be done even though it involves giving retransfers, a practice which the company abandoned some years ago.

**Referendum Vote Asked Upon Amendment of Cleveland Franchise.**—The socialists of Cleveland, Ohio, have filed a petition with City Clerk McCray, asking for a referendum vote upon the amendments made to the Cleveland Railway franchise by the City Council. It is claimed that the petition contains more than 15,000 signatures, while the required number is a little over 12,000. Should it be found that the petition contains the necessary number of registered voters' names, a vote will be taken at the regular election in November, unless the city should set an earlier date. At any rate, the step will delay improvements.

**Arbitration Difficulties at Detroit, Mich.**—Conferences between J. C. Hutchins, president of the Detroit United Railway, and William D. Mahon, on the question of wages and hours for trainmen, were abandoned on Aug. 7, after it

became apparent that a satisfactory agreement could not be reached. The company offered to advance the wages 1 cent an hour, but this was not accepted. The arbitrators named by the company and the union, respectively, have failed so far to agree upon a third man, and every effort is being made to find some one who will be acceptable to both sides.

**Conference on Valuation at Lincoln, Neb.**—The Nebraska State Railroad Commission has issued a call to railroad commissioners of thirteen other States to attend a conference to be held in Lincoln, on Aug. 29, for the purpose of discussing the question of physical valuation. The letter reads in part as follows: "The purpose of this meeting is to discuss and agree, if possible, upon plans for the unification and standardization of methods in obtaining a physical valuation of public service properties by the several State departments now interested in this work; also to arrange for the permanent association of those individuals having to deal with this very important matter, if deemed advisable. Much interest has already been manifested in a preliminary suggestion that such conference be held, and it is hoped that a goodly representation of the various State commissions will be present."

**Decision in Covington (Ky.) Franchise Case.**—Judge M. L. Haberson, of the Kenton Circuit Court, Covington, Ky., on Aug. 7 rendered a decision holding that the South Covington & Cincinnati Street Railway is not liable under certain franchise ordinances. The action was begun to recover \$2,600 a year under an ordinance of July 18, 1887. The company had paid these yearly amounts until 1892, when an ordinance was passed providing for the payment of \$2,600 a year for the first five years, \$4,000 for the next five years, \$5,000 annually for the next five years and \$6,000 annually for the last five years of a twenty-year period provided in the ordinance. All the installments under the last ordinance have been paid and the city is now receiving \$6,000 a year. The company contended that this last ordinance operated as a repeal of the first one, and it was sustained in this contention.

**Strike on Coney Island & Brooklyn Railroad.**—The strike of the conductors and motormen of the Franklin Avenue, Smith Street and Hamilton Avenue lines of the Coney Island & Brooklyn Railroad, which began on Aug. 5, 1911, is now over. After two weeks from the beginning of the strike the cars are being operated by men who were regularly employed at the main office of the company for permanent positions. The new men, the company officials say, signed under the old flat rate of 23 cents an hour. These men have replaced strikebreakers who were employed at first to break the strike. The barracks and restaurant at Franklin Avenue car house were closed on Aug. 15 and the barracks and restaurant at the Smith street car house were closed Aug. 18. About twenty strikers have made application for positions as individuals, and their applications are being considered. Two of the applications have been acted upon favorably and the men are back on the cars. A parade by the strikers and their sympathizers had been planned for Aug. 12, but it was prohibited by the police.

**Illinois Committee Investigates Commissions in Wisconsin and New York.**—John Dailey, of Peoria, chairman of a committee of the Illinois Legislature, in speaking of the investigations by that committee into the Railroad Commission of Wisconsin and the New York Public Service Commission, Second District, stated that the conditions in New York State are more nearly like those existing in Illinois than conditions in Wisconsin, as both Illinois and New York have one large city which has a predominating influence. The question of a divided commission in Illinois is a vital one in connection with the investigation which the Illinois committee is making. Mr. Dailey referred to the large amount of business handled by the New York commission. He said that the committee was very much impressed by the high character of the members of the Wisconsin commission and the Wisconsin laws, but that it was more impressed with the expedition exercised in the dispatch of business by the New York commission of the Second District. The committee also was impressed strongly by the independence of the New York commission.

# Financial and Corporate

## New York Stock and Money Markets

August 16.

Partial recovery from the violent decline that occurred late last week was made on Monday, but further reaction took place on Tuesday, and in to-day's market many issues reached their lowest prices thus far in the year. News of several failures abroad and selling for foreign account assisted in depressing the local market. Recent declines in the grain markets indicate improvement in crop conditions. The money market has not changed appreciably since the last report. Quotations to-day were: Call, 2@2½ per cent; ninety days, 3@3¼ per cent.

### Other Markets

Weakness has developed in the outside markets, reflecting conditions on the New York Exchange. Prices fell to-day in the Philadelphia market.

Chicago Elevated Railways preferred was sold at 85 to-day, a drop of 5 points from the last quotation. Changes in the common were fractional. Prices in general showed a downward tendency.

Declines were registered throughout the active list in Boston to-day and of the copper shares some lost from 3 to 5 points.

Very little business was done in the Baltimore market on Wednesday and the small amount of trading resulted in lower prices.

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

	Aug. 9.	Aug. 16.
American Light & Traction Company (common).....	a302	a296
American Light & Traction Company (preferred).....	a106	a106½
American Railways Company.....	44½	*44½
Aurora, Elgin & Chicago Railroad (common).....	*44½	*44½
Aurora, Elgin & Chicago Railroad (preferred).....	*87	*87
Boston Elevated Railway.....	127	126½
Boston Suburban Electric Companies (common).....	a15	*15
Boston Suburban Electric Companies (preferred).....	75	*75
Boston & Worcester Electric Companies (common).....	*13	*13
Boston & Worcester Electric Companies (preferred).....	*56	*56
Brooklyn Rapid Transit Company.....	76½	*74¾
Brooklyn Rapid Transit Company, 1st ref. conv. 4c.....	*86¾	*86¾
Capital Traction Company, Washington.....	a132	a131
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	*3	*3
Chicago & Oak Park Elevated Railroad (preferred).....	*5	*5
Chicago Railways, pteptg., ctf. 1.....	a97	*97
Chicago Railways, pteptg., ctf. 2.....	a30¾	*30¾
Chicago Railways, pteptg., ctf. 3.....	a12	a12
Chicago Railways, pteptg., ctf. 4.....	7½	*7½
Cincinnati Street Railway.....	a131	130
Cleveland Railway.....	*99½	*99½
Columbus Railway (common).....	82	82
Columbus Railway (preferred).....	95	95
Consolidated Traction of New Jersey.....	75¾	76
Consolidated Traction of N. J., 5 per cent bonds.....	a105	a105
Dayton Street Railway (common).....	a25	a25
Dayton Street Railway (preferred).....	a101	a101
Detroit United Railway.....	a75	a75
General Electric Company.....	155	151
Georgia Railway & Electric Company (common).....	154	154
Georgia Railway & Electric Company (preferred).....	92	92
Interborough Metropolitan Company (common).....	a16½	a15½
Interborough Metropolitan Company (preferred).....	a44½	a42
Interborough Metropolitan Company (4½s).....	77½	77½
Kansas City Railway & Light Company (common).....	a19	a19
Kansas City Railway & Light Company (preferred).....	a44	a44
Manhattan Railway.....	*143	a137
Massachusetts Electric Companies (common).....	a21	19
Massachusetts Electric Companies (preferred).....	a92	89½
Metropolitan West Side, Chicago (common).....	*27½	*27½
Metropolitan West Side, Chicago (preferred).....	*75	*75
Metropolitan Street Railway, New York.....	*15	*15
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	72¾	69½
Northern Ohio Light & Traction Company.....	*50½	*50½
Northwestern Elevated Railroad (common).....	*30	*30
Northwestern Elevated Railroad (preferred).....	*70	*70
Philadelphia Company, Pittsburgh (common).....	53½	53
Philadelphia Company, Pittsburgh (preferred).....	44	44
Philadelphia Rapid Transit Company.....	23¾	23
Philadelphia Traction Company.....	85½	85½
Public Service Corporation, 5% col. notes (1913).....	*94	a94
Public Service Corporation, ctf. 5.....	*107	a107
Seattle Electric Company (common).....	a110½	a110½
Seattle Electric Company (preferred).....	a103	*103
South Side Elevated Railroad (Chicago).....	76¾	95¾
Third Avenue Railroad, New York.....	a94	*8½
Toledo Railways & Light Company.....	*6½	*6½
Twin City Rapid Transit, Minneapolis (common).....	a107	a107
Union Traction Company, Philadelphia.....	*51¾	51
United Rys. & Electric Company (Baltimore).....	18	18
United Rys. Inv. Co. (common).....	a38	31½
United Rys. Inv. Co. (preferred).....	a63¾	60
Washington Ry. & Electric Company (common).....	a45	a44½
Washington Ry. & Electric Company (preferred).....	a91	a85½
West End Street Railway, Boston (common).....	88½	88
West End Street Railway, Boston (preferred).....	90	88
Westinghouse Elec. & Mfg. Co.....	a65½	65½
Westinghouse Elec. & Mfg. Co. (1st pref.).....	*118¾	114

a Asked. \*Last sale.

## ANNUAL REPORT

## East St. Louis &amp; Suburban Company

The circular report to shareholders gives the following earnings, expenses and taxes of the operating companies comprising the East St. Louis System and the fixed charges (interest and taxes of the East St. Louis & Suburban Company) for 1908, 1909 and 1910:

	1908	1909	1910
Gross receipts .....	\$2,009,514	\$2,035,789	\$2,364,142
Operating expenses .....	1,062,310	1,097,236	1,223,354
Net earnings.....	\$ 947,204	\$ 938,553	\$1,140,788
Interest and taxes, all companies	571,655	587,907	605,462
Surplus .....	\$ 375,549	\$ 350,646	\$ 535,326
Preferred dividend .....	350,000	350,000	350,000
Surplus .....	\$ 25,549	\$ 646	\$ 185,326
Per cent of operating expense..	52.8	53.9	51.7

Gross earnings in 1910 increased 16 per cent over 1909, and net earnings 21.5 per cent.

C. M. Clark, the president, states in the report in part:

"There was expended for construction of track, cars, power, new installations in connection with new customers, etc., \$193,354, of which \$163,810 was charged to capital accounts and \$29,544 to renewals and replacements. There are 185.3 miles of track in the system, of which the operating companies own 181.5 miles, 3.8 miles being operated under trackage agreement.

"A conservative estimate of the population served by the lines of the East St. Louis & Suburban Company in 1910 is 150,000, compared with 85,000 in 1900, an increase of 76.4 per cent. In addition the lines of the company enter St. Louis over the Eads bridge, thereby reaching a population of nearly 700,000 additional.

"The territory served by the East St. Louis & Suburban System, including East St. Louis, Belleville, Madison, Granite City and Alton, is essentially a manufacturing district, made up largely of industries which manufacture railway equipment and supplies. The prosperity of the community is therefore largely dependent upon general railway conditions throughout the country, and at the present time the railways are limiting as much as possible their orders for supplies and equipment. Any improvement in these conditions will be reflected immediately in the earnings of the East St. Louis & Suburban Companies. The physical condition of the property is in excellent shape to take full advantage of any improvement in business conditions.

"There are two elements in the present situation which are very promising for the future prosperity of the company. About one year ago there was created by law the East Side Levee and Sanitary District for the purpose of building levees to protect this section from floods of the Mississippi River and to divert Cahokia Creek so as to allow its waters to reach the Mississippi without passing through the city of East St. Louis, thereby removing a great source of danger during high water. Work has been progressing rapidly on the Cahokia Creek diversion channel and the levee work. The completion of these two undertakings will result in East St. Louis and the territory immediately north being absolutely protected from floods. The president of the commission in charge of this work states that the northern protection of the district will be entirely completed by Sept. 15, 1911, and that before Jan. 1, 1912, the levee work will be in progress along the entire front from the diversion to the southern limits of this district.

"Another important matter which will naturally benefit East St. Louis and adjacent territory is the construction of the hydroelectric power plant at Keokuk, Ia. Active work is progressing in building a dam across the Mississippi River and it is expected that by 1913 electricity will be delivered from this development to St. Louis and adjacent territory. The territory served by the lines of this company will naturally be benefited by this large supply of cheap electric power, experience elsewhere having shown that cheap power invariably stimulates manufacturing and encourages the location of new industries. This means increased sales of power by your company as well as increased earnings from electric-light and railway business."

The total number of transfer and revenue passengers

carried in 1910 was 45,688,867, as compared with 40,943,538 in 1909 and 40,007,779 in 1908.

**Boston (Mass.) Elevated Railway.**—Directors of the West End Street Railway have sent a circular to stockholders advising the sale to the Boston Elevated Railway. They state that Richard Olney has furnished an opinion that the contention of the opponents of the merger, who declare that the act is unconstitutional, is not well taken. In this opinion the counsel of the West End Street Railway concurs. The directors say they consider it safe for the stockholders to rely on the fairness of the tribunal provided by the act to decide whether, after 1922, the common stock shall bear more than a 7 per cent dividend, and state that in their judgment the act is more favorable to the stockholders than any legislation that would probably be made by any future Legislature. Continuing, the circular says: "Your directors feel that the position of your stock under the proposed consolidation is safer than if the act were rejected. It must be borne in mind that future financing after the consolidation must under the law be so done by the elevated that its bonds shall not increase faster than its common stock, all of which common stock will add to your security. Moreover, it should be borne in mind that it is unconstitutional to limit by legislation the earnings of any company to a point below a reasonable return on the sum invested. Finally, the elevated has never been able to issue in the past and can never hereafter issue securities, either bonds or stocks, for any of its expenditures, whether for land damages, rights-of-way, or for anything else, except with the approval of the Board of Railroad Commissioners." The West End stockholders' protective committee has issued circulars to West End stockholders, urging the non-acceptance of the act.

**Chicago (Ill.) Elevated Railways.**—The Northwestern Elevated Railroad, a subsidiary of the Chicago Elevated Railways, has elected new officers and directors. Britton I. Budd was elected president, to succeed Mason B. Starring. Samuel Insull was made chairman of the board of directors. All but three of the old members retired and the following board was elected: Samuel Insull, Britton I. Budd, William A. Fox, Henry A. Blair, W. V. Griffin, Mason B. Starring, Samuel McRoberts, John H. Gulick and Ira M. Cobe. Messrs. Insull, Blair, Cobe and McRoberts are four of the seven members of the board of governors of the Chicago Elevated Railways. The holders of the stock trust certificates for stock of the Northwestern Elevated Railroad have been notified of the termination of the voting trust agreement. At a special meeting of the directors of the Metropolitan West Side Elevated Railway, also a subsidiary of the Chicago Elevated Railways, the following new board of directors was elected: Samuel Insull, W. A. Fox, J. H. Gulick, Ira M. Cobe, Henry A. Blair, John F. Gilchrist and Gilbert E. Porter in place of Charles C. Adsit, R. Floyd Clinch, H. A. Dewindt, James B. Forgan, George H. High, Charles H. Requa and Joseph E. Otis, who have resigned. Fred A. Delano, former chairman, H. G. Hetzler and Britton I. Budd, were re-elected. Mr. Insull was elected chairman of the new board and Mr. Budd retains the presidency of the road. P. D. Sexton remains as secretary and treasurer until the annual meeting, the first Monday in February. The new members of the executive and finance committee are Samuel Insull, Henry A. Blair, Ira M. Cobe, H. G. Hetzler and President Budd. President Budd and Mr. Hetzler were members of the old executive committee.

**Chicago & Oak Park Elevated Railroad, Chicago, Ill.**—A minority stockholders' protective committee, consisting of Albert G. Perrill, Theodore W. Smith, Alfred Cohn, Corey E. Robinson and William Dougall, with Frederick A. Fischell as counsel, calls for deposits of the stock with the Continental & Commercial Trust & Savings Bank, Chicago, on or before Nov. 1, under an agreement dated July 7, 1911, effective when 12,000 shares are deposited. The object is to induce the Chicago Elevated Railways to purchase the Oak Park minority shares, the controlling interest (53 per cent), which is held by the Northwestern Elevated Railroad, being already virtually in its possession.

**Columbus, Delaware & Marion Railway, Columbus, Ohio.**—William M. Rockel, as commissioner in the case of Eli M. West, receiver, against John G. Webb, president of the Columbus, Delaware & Marion Railway, wherein an ac-

counting for various transactions was asked, had a hearing on the matter at Springfield, Ohio, on Aug. 7. James S. Webb was the principal witness. He testified that he had not been interested in the transactions. John G. Webb, president of the company, was not present, and the hearing was adjourned to Aug. 16, so that he could testify. C. C. Williams, who was cited for contempt of the Franklin County court in connection with the appointment of George Whysall as receiver of the Columbus, Delaware & Marion Railway by Judge Daniel M. Babst, on July 11, filed his answer on Aug. 7. He declared that he represented Messrs. Webb, Whysall and Walker at Marion in good faith.

**Joliet & Southern Traction Company, Joliet, Ill.**—The bondholders' committee of the Joliet & Southern Traction Company has extended the time for the deposit of bonds from Aug. 1 to Aug. 15. The interest on the bonds of the Joliet, Plainfield & Aurora Railroad, due on Aug. 1, 1911, was not paid.

**Kokomo, Marion & Western Traction Company, Kokomo, Ind.**—F. R. McMullin & Company and the Ft. Dearborn Trust & Savings Bank, Chicago, Ill., are offering, at a price to yield about 5¾ per cent, \$600,000 first mortgage 5 per cent bonds of the Kokomo, Frankfort & Western Traction Company, guaranteed principal and interest by the Kokomo, Marion & Western Traction Company. The bonds are dated July 1, 1911, and are due on July 1, 1941, but are redeemable on any interest date at 105 and interest on 60 days' notice.

**Ocean Shore Railway, San Francisco, Cal.**—A. C. Kains has transferred to W. A. Martin his interest in the Ocean Shore Railway, including property in San Francisco, San Mateo and Santa Cruz Counties, rights-of-way and other property. Mr. Martin has recently succeeded Mr. Kains as a member of the bondholders' committee of the Ocean Shore Railway.

**Riverside Traction Company, Trenton, N. J.**—C. L. Rihl, secretary of the company, gives notice that in order to provide funds to pay bills incurred and to be incurred in the rehabilitation of the property and for additions thereto, and to provide working capital, an assessment of \$10 per share (20 per cent) on the common stock is made, payable to H. H. Aikens, treasurer, Philadelphia, in two installments, viz.: \$5.00 per share on Aug. 30 and \$5.00 on Nov. 1, 1911.

**Richmond & Henrico Railway, Richmond, Va.**—Two bills were filed on Aug. 9 in the Law and Equity Court at Richmond, Va., following suits brought some time ago against the Richmond & Henrico Railway by Thomas F. Jeffries, James D. Patton and others. The bills set forth that the company, authorized by the Legislature to do business on March 10, 1902, made contracts that were never carried out. They claim also that the transfer, changing the old company to the Richmond & Henrico Railway, was done without the permission of the State Corporation Commission.

**San Joaquin Valley Electric Railway, Stockton, Cal.**—A mortgage has been filed by the San Joaquin Valley Electric Railway to the Mercantile Trust Company of San Francisco, as trustee, to secure an issue of \$1,000,000 bonds due 1941, of which about \$825,000 are to be issued in connection with the construction, and equipment of an electric road between Stockton and Modesto, about 35 miles.

**Seattle, Renton & Southern Electric Railway, Seattle, Wash.**—Peabody, Houghteling & Company, Chicago, Ill., have acquired control. The following directors and officers have been elected: William R. Crawford, president; James B. Houghteling; E. M. Mills, of Peabody, Houghteling & Company, vice-president; E. S. McCord, of Kerr & McCord, attorneys, Seattle; F. J. French, secretary.

**Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass.**—F. S. Field, Shattuckville, Mass., has been elected a director of this company, to succeed the late Moses Newton.

**Tampa (Fla.) Electric Company.**—This company has declared, in connection with the regular quarterly dividend of 2 per cent, an extra dividend of 1 per cent, both payable on Aug. 15.

**Underground Electric Railways of London, Ltd., London, Eng.**—The Underground Electric Railways of London, Ltd., has drawn for redemption on Jan. 15, 1912, at par and interest

to that date, £868,700 of its 4½ per cent bonds of 1933. Arrangements have also been made to redeem on the same date £220,000 additional of the same bonds, which in accordance with the trust deed have been bought in the open market below par. The total amount of 4½ per cent bonds of 1933 to be redeemed on the above date is, therefore, £1,088,700 out of an outstanding issue of £2,818,700. These bonds were issued in 1908.

**Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.**—The Cleveland Stock Exchange has listed \$5,000,000 first mortgage, 5 per cent bonds, \$1,460,000 6 per cent non-cumulative preferred stock and \$3,000,000 common stock. The certificates of deposit of the securities of the old company have been withdrawn from the exchange.

**Wilmington, New Castle & Southern Railway, New Castle, Pa.**—Appraisers have gone over the New Castle & Delaware City line of the Wilmington, New Castle & Southern Railway to ascertain the scrap value of the property if operation should be abandoned.

**Dividends Declared**

Columbus Railway & Light Company, Columbus, Ohio, quarterly, 1¼ per cent.

Kokomo, Marion & Western Traction Company, Kokomo, Ind., 1½ per cent, common.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, ¾ per cent, common.

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

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., quarterly, ½ per cent, common.

**MONTHLY ELECTRIC RAILWAY EARNINGS**

BATON ROUGE ELECTRIC COMPANY.					
Period.	Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.
1m., June, '11	\$9,870	\$6,524	\$3,346	\$2,041	\$1,306
1 " " '10	8,942	5,825	3,118	1,945	1,173
12 " " '11	114,267	70,665	43,602	23,707	19,896
12 " " '10	106,371	68,955	37,516	22,905	14,511
BROCKTON & PLYMOUTH STREET RAILWAY.					
1m., June, '11	\$10,974	\$8,335	\$2,639	\$1,559	\$1,080
1 " " '10	10,419	7,485	2,934	1,760	1,174
12 " " '11	120,701	84,394	36,308	18,843	17,465
12 " " '10	125,089	91,010	34,079	21,007	13,071
CLEVELAND, PAINESVILLE & EASTERN RAILWAY.					
1m., June, '11	\$35,765	\$18,736	\$17,029	\$8,112	\$8,916
1 " " '10	33,260	17,107	16,153	9,173	7,980
6 " " '11	163,718	91,957	71,761	48,916	22,844
6 " " '10	153,579	83,837	69,741	48,077	21,665
DALLAS ELECTRIC CORPORATION.					
1m., June, '11	\$122,110	\$85,962	\$36,148	\$27,287	\$8,861
1 " " '10	114,514	81,445	33,069	26,604	6,465
12 " " '11	1,551,790	979,726	572,064	315,159	256,905
12 " " '10	1,394,814	906,477	488,337	323,780	164,557
EAST ST. LOUIS & SUBURBAN COMPANY.					
1m., June, '11	\$185,736	\$100,402	\$85,333	.....	.....
1 " " '10	200,553	112,876	86,678	.....	.....
6 " " '11	1,091,720	587,624	504,096	.....	.....
6 " " '10	1,119,353	606,064	513,288	.....	.....
EL PASO ELECTRIC COMPANY AND SUBSIDIARY COMPANIES.					
1m., June, '11	\$52,471	\$31,624	\$20,847	\$8,337	\$12,510
1 " " '10	45,224	27,409	17,815	8,195	9,620
12 " " '11	665,454	386,174	279,280	98,286	180,994
12 " " '10	626,631	361,273	265,358	101,169	164,181
GRAND RAPIDS RAILWAY.					
1m., June, '11	\$101,647	*\$58,273	\$43,374	\$14,993	\$28,381
1 " " '10	99,952	*52,357	47,595	15,065	32,530
6 " " '11	553,636	*320,465	232,895	90,338	142,557
6 " " '10	530,823	*292,618	238,205	90,974	147,231
HOUGHTON COUNTY TRACTION COMPANY.					
1m., June, '11	\$26,940	\$12,495	\$14,446	\$6,498	\$7,948
1 " " '10	26,752	14,578	12,174	6,317	5,857
12 " " '11	604,947	160,780	144,168	78,734	65,434
12 " " '10	320,847	170,159	150,688	76,158	74,530
LAKE SHORE ELECTRIC RAILWAY.					
1m., June, '11	\$113,950	\$58,182	\$55,768	\$34,605	\$21,163
1 " " '10	103,533	52,244	51,289	34,751	16,537
6 " " '11	558,586	313,129	245,547	208,003	37,544
6 " " '10	526,728	298,698	228,030	208,610	19,420
NORTHERN OHIO TRACTION & LIGHT COMPANY.					
1m., June, '11	\$245,097	\$134,983	\$110,114	\$44,333	\$65,781
1 " " '10	221,673	123,125	98,548	43,375	55,173
6 " " '11	1,222,676	697,023	525,653	266,107	259,545
6 " " '10	1,087,335	624,230	463,105	259,916	203,188
PADUCAH TRACTION & LIGHT.					
1m., June, '11	\$20,648	\$11,940	\$8,708	\$7,748	\$960
1 " " '10	19,740	11,685	8,055	6,989	1,066
12 " " '11	256,859	140,591	116,268	90,705	25,563
12 " " '10	238,066	143,301	94,766	82,012	12,754
PENSACOLA ELECTRIC COMPANY.					
1m., June, '11	\$24,742	\$14,232	\$10,510	\$5,851	\$4,660
1 " " '10	21,763	12,808	8,955	5,053	3,903
12 " " '11	284,165	165,349	118,816	66,637	62,179
12 " " '10	257,716	150,138	107,577	56,103	51,475

## Traffic and Transportation

### Overcrowding Ordinance Upheld by Circuit Court at Covington, Ky.

In the case of the Cincinnati, Newport & Covington Light & Traction Company against the city of Covington, Ky., wherein an injunction was asked to prevent the enforcement of an ordinance limiting the number of passengers to be carried on a car, Judge Matt. L. Haberson, of the Kenton Circuit Court, rendered a decision on Aug. 7, upholding the measure. The ordinance stipulates that it shall be unlawful to carry more than one and one-third times the seating capacity of any car, excepting on July 4, Decoration Day and Labor Day; that there shall be an open space large enough for ingress and egress, and that it shall be kept free and open, a fine being provided where persons refuse to vacate on request of the conductor; that the company shall operate enough cars at all times to accommodate the people within the meaning of the ordinance, and that the council shall have power at any time to direct the company to increase the number of cars on any line to a sufficient number to accommodate the public.

The company attacked the ordinance on the ground that the city has no power under its charter to control the operation of cars; that the ordinance embraces more than one subject; that it impairs the obligations of a contract entered into between the company and the city; that it is unlawful and unreasonable, and that it is an interference with the interstate commerce law and is not in accord with the federal constitution.

The attorneys for the city argued that the remedy in this case did not lie in injunction proceedings, but in a writ of prohibition and that the petition should be dismissed upon that ground.

The decision states in part:

"Ordinances to prevent overcrowding of street cars have been enacted in Pittsburgh, Minneapolis and Detroit; and in Boston prohibiting the company from permitting persons to stand between seats upon the open cars. These cases do not appear to have been as yet passed upon by the courts of last resort in the respective jurisdictions, but copies of the opinions of the lower courts deciding and passing upon the validity of the ordinances have been furnished the court by counsel upon both sides, and so far as the power of the municipality to enact an ordinance prohibiting the overcrowding of street cars, the courts in each case decided that it is within the police power of the municipality, if the regulation is reasonable.

"Even if the regulation was required to directly affect the safety, health or morals of the public the court holds that overcrowding of the cars does so, but the court is of the opinion that that is not the limitation of the police power.

"There is a very indefinite statement in the evidence relative to whether or not the plaintiff is engaged in interstate commerce at all. It has no franchise or property except in Kentucky, and has no franchise in Cincinnati to operate over its streets. There is another corporation called the C. N. & C. Street Railway Company, or the Covington & Cincinnati Street Railway Company, which it seems has rights over certain streets in Cincinnati. However, if it did own and operate the line in Cincinnati this ordinance does not, in the opinion of the court, interfere with interstate commerce, and is not such a burden upon it as is restricted by the federal grant of power to regulate commerce between the States.

"The court is of the opinion that the evidence shows that there is not the slightest difficulty in operating a sufficient number of cars in Covington to comply with the ordinance under consideration. The schedule of the cars clearly shows it. The only place in Covington where all the lines operate over the same tracks is between Third and Second streets, where they go upon the bridge. The bridge is double-tracked, with a driveway in the center. The greatest number of cars which operate over this track during the rush hours is 81 cars per hour, according to the testimony of T. M. Green, superintendent. On the tracks up Walnut and over Fifth Street to Vine, he testified that the Cincinnati Traction Company operates 254 cars per hour, and

besides that the plaintiff operates 81 cars per hour, which makes 335 cars per hour, and this, too, in the busy part of Cincinnati with its wagon and automobile travel using the street.

"It is not for the court to determine whether or not this ordinance will operate successfully, nor is it for the carrier to complain that the public by this ordinance is depriving itself of the privilege of crowding cars, which it is claimed it loves to do. The ordinance has for its purpose a lawful one. It is within the power of the municipality to enact it, and it violates no constitutional or other right of the plaintiff, and, in the court's opinion, is reasonable; and that is all that can be passed upon by the court."

A stay was given, allowing twenty days for the company to appeal the case to the higher courts.

### Employees' Clubs in Portland, Ore.

The Portland Railway, Light & Power Company, Portland, Ore., has built three clubhouses for its employees. one at the Sellwood carhouse, one at Piedmont, and one at the East Ankeny carhouse. A temporary clubhouse has also been fitted up at Savier Street. The company proposes also to build clubhouses for the use of the linemen. Altogether this work has cost about \$100,000, and with the two contemplated buildings the cost will be about \$200,000.

The clubhouse at Sellwood was opened last May. It is a brick building, two stories high, with a basement, and represents an outlay of about \$20,000. In the basement are a steam-heating plant, lavatories for the men, and a room with one hundred and fifty-two individual lockers. The first floor is used partly by the company and partly by the men. Here are the offices for the inspectors, an office for the cashier, a waiting room for the men and the suites of two rooms each for the chief dispatcher and the superintendent. Here, also, are shower and tub baths for the men. The second floor is given over altogether to the men. On this floor, in the rear, there is a large billiard room with two pool tables, and athletic paraphernalia. Around the walls are artistic settees. In the front of this floor is the library. Here the library association has installed a branch library with fiction and technical works. On this floor there also are four bedrooms.

The clubrooms at the Piedmont and Ankeny carhouses, although not in separate buildings, have practically the same appointments as the clubhouse at Sellwood. The clubrooms to be built at the Savier carhouse will also conform to the same general lines. The Ankeny structure is of concrete. The Piedmont club differs from the others in that it is equipped with a bowling alley. The clubhouse for the linemen will be used in part by the lighting department of the company. The building will be 100 ft. x 200 ft., two stories high, with a basement. It will be built of brick or reinforced concrete. In the basement there will be a garage for the automobiles of the company. On the first floor there will be a waiting room and a meter room. The rooms for the men will occupy the entire second floor.

### Effect of Low Fares on Wages

In connection with the question of street railway fares on the lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., which is now before the Railroad Commission of Wisconsin, John Humphrey, secretary of the Wisconsin State Board of Arbitration, has brought forward the factor of wages of the employees. In a recent interview Mr. Humphrey was quoted as follows:

"It seems to me that this is an especially timely occasion for calling attention to the fact that while the interests of the investor and of the traveling public are considered in general public discussion of the 3-cent fare question, the position of the employees of the company seems to have been lost sight of.

"In this instance I believe the Railroad Commission would be justified in taking into consideration: First, whether the employees of the company are receiving adequate remuneration, and second, what provision, if any, has been made for future rewards for efficient and loyal service. Here are thousands of men who have the lives of thousands of their fellow citizens daily in their care, and it seems to me circumstances well warrant a consideration of the position they

occupy in the community, and the pay that they are getting for work performed.

"While adjusting the difficulty between the employees of the La Crosse City Railway and the company two years ago I recommended that the State enlarge the powers of the Railroad Commission to furnish a tribunal to which labor could appeal for the adjustment of such questions as the wage question, an economic problem that is perpetually alive.

"The Legislature is about to adjourn without having given this subject consideration. It is not yet too late. I believe it is a most important question, and that while there are investors' interests and public interests generally at stake, there are also specifically the interests of employees to bear in mind."

**Near-Side Stops in Lawrence, Kan.**—On Aug. 1 the Lawrence Railway & Light Company began to stop its cars at the near side of all crossings.

**Pennsylvania Road Discontinues Sale of Strip Tickets.**—Announcement was made by the Southern Pennsylvania Traction Company, Chester, Pa., on Aug. 13, that it had decided to abolish the sale of six tickets for 25 cents in Chester.

**Special Provision for Women in Brooklyn Bridge Rush.**—The bridge police department and officials of the Brooklyn Rapid Transit Company are co-operating in an experiment designed to separate men and unescorted women at the Brooklyn Bridge between 5 and 6:30 p. m. in order that women may get seats in the cars.

**Collision Near Warren, Me.**—A collision occurred on the Rockland, Thomaston & Camden Street Railway, Rockland, Me., near Warren, on Aug. 8. It is attributed to a misunderstanding of orders by trainmen. One passenger was injured so that he died the next day. The Maine Railroad Commissioners made an investigation on Aug. 15 of the causes of the accident.

**Seattle Passes Held by Municipal Officials Good Only When Used for Official Business.**—The Seattle (Wash.) Electric Company which furnishes several hundred city employees with passes annually, has notified the head of each department that the public service commissions law prohibits the issue of such transportation except for use exclusively when the holder is engaged in city business.

**Increase in Wages in Chester, Pa.**—The Southern Pennsylvania Traction Company, Chester, Pa., increased on Aug. 15 the wages of employees 1 cent per hour, making the rate 24 cents for the old men and 22 cents to new men, who are now receiving 21 cents. A sliding scale has been in vogue for some time, by which new men received 21 cents per hour the first year and an advance of 1 cent per year until the fourth year of service.

**Reduced Tickets for School Teachers Held to Be Discrimination in New Jersey.**—In a decision announced by the New Jersey Board of Public Utilities Commissioners it was held to be illegal for street railways to sell tickets to school teachers at reduced rates. The commission finds that reduced rates of fare for the trips of school teachers are prima facie discriminatory and therefore illegal, unless there be a municipal contract with the carrier entitling the teachers to ride at a reduced rate as municipal employees.

**Verdict in New Jersey Head-On Collision Case.**—A coroner's jury in Hackensack, N. J., has officially placed upon F. R. Pilgrim, superintendent of the North Jersey Transit Company, the blame for the head-on collision which occurred near Ridgewood, N. J., on July 21 and which resulted in the death of Mr. Pilgrim and William Hutchison, motorman of the opposing car, and in the injury of fifteen persons. The evidence showed that Mr. Pilgrim had endeavored to run an extra car past a signal set at danger. It was also believed that he had not heard the shouts of warning because of his deafness.

**Trainmen on Detroit United Railway Arrested on Charge of Manslaughter.**—On Aug. 8 a coroner's jury rendered a verdict at Dearborn, Mich., on the death of the passenger who lost his life as the result of a head-on collision on the Detroit, Jackson & Chicago division of the Detroit United Railway on July 30, 1911. The jury found that the crew of the east-bound train made an error, and referred

to the lack of a double track on the railway at that point. The motorman of the east-bound train, Forrest Woodin, and the conductor, Frederick Dresselhouse, have been arrested at the request of the State's attorney of Wayne County, F. H. Aldrich, on a charge of manslaughter. The company's inability to double-track its line at this point was explained in the *ELECTRIC RAILWAY JOURNAL* of Aug. 12, 1911.

**Trainmen Arrested in Minneapolis for Not Displaying Car-Full Sign.**—Harold Smith, a conductor and H. Evart, motorman, of the Twin City Rapid Transit Company, Minneapolis, were arrested on Aug. 8 on the charge of taking on more passengers than the legal capacity of the car. N. M. Thygeson, counsel for the company, declared before Judge E. A. Montgomery in the Municipal Court that the employees of the company were arrested for something they could not help, saying that if any violation had been committed it was traceable to the company officials for failure to put more cars in service. He said the employees cannot build cars and put them in service, yet the police are subjecting them to arrest under the ordinance. Judge Montgomery announced that he would give his decision at a later date.

**Through Routes and Joint Rates Established for Oakland & Antioch Electric Railroad.**—The Railroad Commission of California rendered a decision on Aug. 8 establishing through routes and joint rates between the Oakland & Antioch Electric Railroad and the Atchison, Topeka & Santa Fe Railway, operative Sept. 10. Application for the through route and joint rates with the Santa Fe Railroad was made by the Oakland & Antioch road on March 16, 1911. After several months of ineffectual effort to bring about the arrangement the Railroad Commission sent its expert to the territory affected, and he found a strong demand for the through routes and joint rates among shippers and residents. The commission in overruling the decision of the Santa Fe stated that there was no reason for discrimination against electric roads, held that the combination of local rates was an excessive and unreasonable demand and set aside practically all of the contentions of the steam road.

**Improvements in Service of the Interborough Rapid Transit Company.**—The 16-cp carbon lamps in the subway express cars of the Interborough Rapid Transit Company of New York are being replaced by 32-cp tungsten lamps. The Interborough company has furnished subway conductors, guards, station agents, gatemen and porters with two white duck uniforms apiece, and has contracted to have the suits laundered as often as necessary without expense to the employees. T. P. Shonts, president of the Interborough Rapid Transit Company, in a letter to Mayor Gaynor said that his company desires to afford to the inmates of orphan asylums and to other indigent children and their mothers an opportunity during the summer months to ride free to and from Bronx Park and Van Cortlandt Park, between the hours of 8 a. m. to 10 a. m. and 4 p. m. to 6 p. m. Mayor Gaynor requested Charity Commissioner Drummond to make all further arrangements with the Interborough Company.

**Answer of Schenectady Railway on Fare Question.**—The Public Service Commission of the Second District of New York has received the answer of the Schenectady Railway upon the complaint of Mayor Charles C. Duryee as to the refusal of that company to sell six passenger tickets for 25 cents. The company denies that the fares now charged within the city are unjust and unreasonable, and denies that prior to March, 1909, it transported its passengers for a flat rate of five cents for a single passage and sold six tickets for 25 cents, and that during the period of the sale of such tickets it obtained many franchises from the city of Schenectady without other condition except as prescribed by law upon the representation or agreement, express or understood, that the sale of such tickets at the rate of six for 25 cents would not be discontinued. The company admits that prior to March, 1909, it did sell six tickets for 25 cents, good within the local fare limits of the city. It denies that the withdrawal of the six tickets for 25 cents was unjust and unreasonable, and finally states that the five-cent flat rate is necessary to yield a reasonable average return upon the value of the property actually used in the public service.

## Personal Mention

**Mr. John Craig** has been appointed engineer of the power station of the Alton, Granite & St. Louis Traction Company, Alton, Ill., to succeed Mr. F. A. Schlosser.

**Mr. W. H. Dowhauer** has been appointed master mechanic of the Sunbury & Northumberland Electric Railway, Williamsport, Pa., to succeed Mr. H. F. Lentz.

**Mr. F. Wheeler** has been appointed engineer of the power station of the Ottumwa Railway & Light Company, Ottumwa, Ia., to succeed Mr. A. A. Ainsworth.

**Mr. E. A. Wine** has been appointed chief engineer and engineer of power stations of the Bartlesville (Okla.) Interurban Railway, to succeed Mr. W. Fowbles.

**Mr. G. W. Jenks** has been elected vice-president of the Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass., to succeed the late Moses Newton.

**Mr. Joseph H. Moore** has been elected vice-president of the Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa., to succeed Mr. W. A. Goehring.

**Mr. Joseph M. Burns** has been appointed superintendent of the electrical and mechanical department of the Morris County Traction Company, Morristown, N. J.

**Mr. C. L. Easton** has been appointed chief engineer of the power station of the Bakersfield & Kern Electric Railway, Fresno, Cal., to succeed Mr. W. R. Mongerson.

**Mr. David M. McClosky** has been elected treasurer of the Webster, Monessen, Bellevernon & Fayette City Street Railway, Charleroi, Pa., to succeed Mr. J. K. Tener.

**Mr. K. W. Daly** has been elected vice-president of the Webster, Monessen, Bellevernon & Fayette City Street Railway, Charleroi, Pa., to succeed Mr. J. K. Tener.

**Mr. Wm. B. S. Davies** has been appointed master mechanic of the Providence & Fall River Street Railway, Swansea Center, Mass., to succeed Mr. A. J. Gardella.

**Mr. R. C. Howe** has been appointed chief engineer of the power station of the Bay State Street Railway, Boston, Mass., at Gloucester to succeed Mr. W. J. Hooper.

**Mr. N. C. Draper**, formerly superintendent of the Ohio Electric Railway, Zanesville, Ohio, has been elected general manager of the Consolidated Light & Power Company, Sioux Falls, S. D.

**Mr. F. W. Adams** has resigned as vice-president and general manager of the Toledo, Fostoria & Findlay Railway, Fostoria, Ohio. Mr. Adams has been connected with the company since its organization.

**Mr. George H. Ross, Jr.**, has been appointed superintendent of transportation of the Morris County Traction Company, Morristown, N. J. Mr. Ross was formerly president of the Hopatcong Construction Company.

**Mr. Charles A. Baumann** has been appointed assistant superintendent of the Essex division of the Public Service Railway, Newark, N. J., to succeed Mr. Bernard F. Mullin, who has been appointed supervisor of inspection.

**Mr. C. F. Beames** has resigned as manager of the power companies controlled by the Northern Ontario Light & Power Company, Ltd., Cobalt, Ont., to become chief electrical engineer to the Government, State of Mysore, India. Mr. Beames sailed from New York for his new post on Aug. 16.

**Mr. Hugh Dougherty** has been appointed superintendent of the Dodson line of the Metropolitan Street Railway, Kansas City, Mo., to succeed Mr. E. C. Ecker, resigned. Mr. Dougherty has been in the service of the Metropolitan company for seven years, having been chief timekeeper for four years.

**Mr. Bernard F. Mullin** has been appointed supervisor of inspection of the Public Service Railway, Newark, N. J. Mr. Mullin will report to Mr. R. E. Danforth, general manager of the company, and will have jurisdiction over all the railway inspectors in the company's employ. Mr. Mullin was formerly assistant superintendent of the company's Essex division.

**Mr. H. R. Warfield**, who has been treasurer, general manager and purchasing agent of the Union Utilities Company, Morgantown, W. Va., has been elected president of the com-

pany. Mr. Warfield retains his title of general manager, but Mr. C. D. Jenkins, heretofore auditor of the company, succeeds him as treasurer, auditor and purchasing agent of the company.

**Mr. H. H. Read** has been elected general auditor of the Bay State Street Railway, Boston, Mass., which is a consolidation of the Boston & Northern Street Railway and the Old Colony Street Railway. He succeeds Mr. D. Dana Hartlett, who retired to engage in other business. Mr. Read has been identified with street railways since 1889, when he became connected with the Globe Street Railway, Fall River, Mass.

**Mr. C. M. Paxton** has been appointed assistant to the general manager of the American Railways Company, Philadelphia, Pa., and entered upon his duties on July 15, 1911. Since Jan. 1 of the present year Mr. Paxton has been connected with an industrial company at Des Moines, Ia. Prior to that time he was connected for seven years with the Dayton & Troy Electric Railway, Dayton, Ohio, serving one year as auditor, one year as secretary and traffic manager, and five years as secretary and general manager. Previously Mr. Paxton had several years' experience in various capacities in the operating department of steam railways.

**Mr. Frederick J. Macleod**, of Cambridge, Mass., has been appointed by Governor Foss of Massachusetts to the office of chairman of the Massachusetts Railroad Commission, to fill the vacancy caused by the resignation of Mr. Walter Perley Hall, lately appointed to be a justice of the Superior Court. Mr. Macleod is a native of Prince Edward Island and is forty-one years of age. He was graduated from Dalhousie College, Halifax, N. S., and from Harvard Law School. He has been engaged in the practice of law since 1899. In 1900 he prepared a report for the United States Industrial Commission as an expert in corporation law and taxation. He has served in the Massachusetts Senate and as chairman of the Democratic State Committee.

**Mr. Henry Gebhart**, formerly superintendent of the Oakwood Street Railway, Dayton, Ohio, has been appointed general manager and purchasing agent of the company to succeed Mr. Harrie P. Clegg, who remains with the company as vice-president. Mr. Gebhart was graduated from the University of Pennsylvania with the degree of electrical engineer. For two years he was instructor in mechanical engineering at the University of Pennsylvania. After leaving the university he was with the Westinghouse Electric & Manufacturing Company, at East Pittsburgh. On June 1, 1907, Mr. Gebhart became connected with the Oakwood Street Railway as superintendent and purchasing agent and recently succeeded Mr. H. P. Clegg as general manager of the company.

**Mr. C. H. Andrews** has recently been appointed assistant general manager of the North Carolina Public Service Company, Greensboro, N. C. Mr. Andrews was graduated from the school of electrical engineering at Purdue University at Lafayette, Ind., in June, 1908. He entered business with the Public Service Corporation of New Jersey in the electrical department and worked at Perth Amboy and at New Brunswick, N. J., until April 1, 1910, when he accepted a position in the electric department of the North Carolina Public Service Company. He served as head of various departments of the North Carolina Public Service Company until April, 1911, when he was appointed assistant manager. Subsequently he was appointed assistant general manager of the company.

**Mr. Masami Suyama**, who has been studying high-tension a.c. and d.c. railway work for the Japanese traffic ministry and State railways, has been spending the present week in visiting the Pennsylvania and New Haven Railroad installations about New York, the works of the Westinghouse Electric & Manufacturing Company and the 1200-volt d.c. lines of the Washington, Baltimore & Annapolis Electric Railroad. Previous to his arrival in this country Mr. Suyama had spent almost a year studying heavy electric-railway work in Germany. Before leaving for Japan, however, he decided to familiarize himself with some of the work done along these lines in the eastern part of the United States. Mr. Suyama hopes to visit the United States again in the near future with the special intention of studying the installations on the Pacific Coast.

## Construction News

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

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

### RECENT INCORPORATIONS

**\*Napa & Clear Lake Railway, Napa, Cal.**—Application for a charter has been made in California by this company to build a 90-mile electric railway from Napa to Lakeport. Capital stock, \$500,000. Directors: C. W. Conlisk, W. M. Rank and R. A. Morton.

**Mesaba Electric Railway, Duluth, Minn.**—Incorporated in Minnesota to build a 35-mile electric railway to connect Hibbing, Chisholm, Buhl, Mountain Iron, Virginia, Eveleth and Gilbert. Preliminary arrangements are being made and contracts will be awarded at once for grading and building bridges. It is expected to have construction under way within thirty days. Franchises will be asked at once. Oscar Mitchell, president, and E. C. Thomas, engineer in charge. [E. R. J., April 15, '11.]

**\*Oklahoma-Shawnee Railway, Oklahoma, Okla.**—Application for a charter will be made in Oklahoma by this company to build a 100-mile electric railway to connect Oklahoma City, Shawnee and Tecumseh, with a branch line to Chandler. This company is a reorganization of the Oklahoma-Shawnee Interurban Railway. Capital stock, \$3,000,000. L. E. Patterson, Oklahoma City, president.

**\*Portland & West Coast Railroad & Navigation Company, Portland, Ore.**—Application for a charter has been made in Oregon by this company to build an electric railway between Minnville and Bay City, via Willamina, Grand Ronde, Tillamook, Sheridan and Pacific City. The company also plans to furnish power and light for Sheridan, Willamina and Tillamook, the power to be secured from the Little Nestucca. In addition, the company plans to operate a line of steamboats on the Yamhill, Nestucca, Siletz and Tillamook rivers, and on Tillamook Bay and the Pacific Ocean. Capital stock, \$1,000,000. Incorporators are W. F. Prier, C. F. Hendricksen and Jay H. Upton. Headquarters, Portland.

**\*Manatawny Railroad, Douglassville, Pa.**—Incorporated in Pennsylvania to build an 8-mile electric railway between Douglassville and Spangville. Capital stock, \$100,000. Incorporators: Milton J. Person, Bethlehem, president; John Palmer, Jr., Jersey City, N. J.; Stephen Robinson, Jr., Audubon, N. J.; Lewis F. Huthmacher, Bethlehem; Charles M. Allen, Bayonne, N. J.; Daniel J. Driscoll, Reading, and Robert L. Runyon, Allentown.

**\*Snyder Avenue Railway, Philadelphia, Pa.**—Application for a charter has been made in Pennsylvania by the Philadelphia Rapid Transit Company for this company to build a double-track line on Snyder Avenue from Delaware Avenue to Thirty-sixth Street in South Philadelphia. Incorporators: Charles O. Kruger, president of the Rapid Transit Company; Alexander Rennick, James J. Springer, George W. Mantz and W. L. Maize.

**South Austin Street Railway, Austin, Tex.**—Chartered in Texas to operate an electric railway in South Austin. Capital stock, \$25,000. Directors: J. H. Green, F. H. Faust, T. M. West and C. V. Birkhead, San Antonio, and E. B. Birkhead, Dallas. [E. R. J., June 11, '10.]

### FRANCHISES

**Pueblo, Cal.**—The Pueblo & Suburban Traction & Lighting Company has asked the City Council for a franchise to extend its lines in Pueblo.

**San Diego, Cal.**—The San Diego Electric Railway has received a forty-two-year franchise from the City Council for all of its lines in San Diego.

**San Jose, Cal.**—The San Jose Railway has asked the Board of Supervisors for a 50-year franchise to extend its lines along Willow Street, Delmas Avenue and Lincoln Avenue in San Jose.

**San Jose, Cal.**—The San Jose & Santa Clara County Railroad has asked the Board of Supervisors for a 50-year franchise to build a single or double-track line over the Alameda road, also for a franchise over Fourteenth Street in San Jose.

**San Jose, Cal.**—The Board of Supervisors has ordered a franchise over Saratoga Avenue from Meridian Corners to the town limits of Santa Clara advertised for sale. It is the intention of the Peninsular Railway to buy the franchise in order that it may connect the interurban line with the line running out of Alameda to Santa Clara, thus forming a loop.

**San Rafael, Cal.**—George D. Shearer, San Rafael, has asked the council for a franchise in San Rafael. It is reported that he has secured funds to build the line if the necessary rights can be secured from the city. The franchise provides for four different routes. [E. R. J., Feb. 25, '11.]

**Venice, Cal.**—Pacific Electric Railway, Los Angeles, has asked the Council for a franchise to build a one-mile extension from Santa Monica to Venice.

**Joliet, Ill.**—The Chicago & Joliet Electric Railway has asked the City Council for a franchise to double track and extend several of its lines in Joliet.

**Forest, Ind.**—The Kokomo, Frankfort & Western Railway, Kokomo, has asked the Council for a new franchise through Forest. This 26-mile railway will connect Middletown, Russiaville, Michigantown and Forest. T. C. McReynolds, Kokomo, general manager. [E. R. J., Aug. 12, '11.]

**Shelbyville, Ky.**—The question of accepting the offer of the Louisville & Interurban Railway to pay \$15,000 for a franchise to operate through the main street of Shelbyville, Ky., will be an issue in the next election.

**Erving, Mass.**—The Miller's River Street Railway, Miller's Falls, has received a franchise from the Selectmen to build its tracks in Erving. F. L. Greene is interested. [E. R. J., Aug. 5, '11.]

**Bay City, Mich.**—A. J. Broesbeck, representing the Saginaw & Flint Railway, Saginaw, has received a franchise from the Common Council for an electric railway in Bay City. Later it will be extended to Saginaw.

**Hibbing, Minn.**—The Mesaba Electric Railway, Duluth, has received a franchise from the City Council in Hibbing. A franchise has also been received by this company in Buhl and in Chisholm. Oscar Mitchell, president. [E. R. J., April 15, '11.]

**Minneapolis, Minn.**—The Twin City Rapid Transit Company will ask the City Council for a franchise to extend several of its lines in Minneapolis.

**Chatham, N. J.**—The Morris County Traction Company has received a franchise on Main Street in Chatham.

**Newark, N. J.**—The Public Service Corporation has asked the City Council for a franchise to build three extensions of its lines in Newark.

**East Syracuse, N. Y.**—The Syracuse Rapid Transit Company has received a franchise from the Board of Trustees to double track its line on Manlius Street in East Syracuse.

**Rome, N. Y.**—The Public Service Commission of the Second District has received a petition from the Utica & Mohawk Valley Railway asking for permission to exercise franchises granted by the city of Rome for various extensions and changes of route in Rome.

**Rock Hill, N. C.**—The North Carolina Traction Company, Danbury, has asked the City Council for a 50-year franchise in Rock Hill.

**Wilkes-Barre, Pa.**—The Wilkes-Barre Railway has asked the City Council for a franchise to extend its tracks on North Main Street in Wilkes-Barre to Brookside.

**Brownsville, Tex.**—S. A. Robertson, representing the San Benito Interurban Railway, has received a franchise from the City Council to build a belt line over the principal streets in Brownsville for freight purposes.

**Richmond, Va.**—The Richmond & Henrico Railway, Richmond, has asked the Common Council for a franchise to extend its lines in Richmond. It expects to double track some of its lines and to build several extensions.

**Mount Vernon, Wash.**—The Bellingham-Skagit Railway, Bellingham, has received a perpetual franchise from the City Council for an electric railway in Mount Vernon. C. M. Drummond, Bellingham, president. [E. R. J., Aug. 5, '11.]



\***Vancouver, Wash.**—Lawrence Harmon, Vancouver, has asked the City Council for a 50-year franchise to build an electric railway in Vancouver to extend east of the garrison and up along the Columbia River.

**Glendale, W. Va.**—The Wheeling Traction Company has received a franchise from the County Court to double track its line through Glendale.

**Sistersville, W. Va.**—The Parkersburg & Ohio Valley Electric Railway, Parkersburg, has received a renewal of its franchise from the City Council in Sistersville.

#### TRACK AND ROADWAY

**Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.**—This company will extend its line to Kingsburg from Selma.

**Pacific Electric Railway, Los Angeles, Cal.**—The construction of an electric railway from Homewood to Watts, for the Redondo line of this company is to begin at an early date. When this connecting link is completed it is the plan of the company to change the entire line from Homewood to Redondo into a broad-gage road.

**Oakland & Antioch Railway, Oakland, Cal.**—J. G. White & Company, Oakland, will receive bids for the construction of a tunnel between Oakland and Walnut Creek.

**Sacramento Valley West Side Electric Railway, Sacramento, Cal.**—This company has awarded a contract to the Dozier Construction Company, Sacramento, for the construction of its electric railway from Woodland to Red Bluff. [E. R. J., May 13, '11.]

**Tidewater & Southern Railroad, Stockton, Cal.**—The survey of this line now being built between Stockton and Merced has reached the city limits of Merced. Branch lines are contemplated for Livingston, Creassey, Winton and Yam; also a branch line in San Joaquin County, to leave the main line in Hilmar colony and run to Newman on the west side of the San Joaquin River. [E. R. J., Aug. 12, '11.]

\***Attawaugan Street Railway, Killingly, Conn.**—This company, which expects to build an electric railway between Dayville, Attawaugan, Ballouville and Pineville, has organized and elected the following officers: Elbert L. Darble, president; M. A. Phillips, secretary, and H. E. Black, treasurer.

**Macon Railway & Light Company, Macon, Ga.**—This company has placed contracts for material to build about two miles of new track in Macon.

**Fox & Illinois Union Railway, Aurora, Ill.**—This company advises that it will begin work about Sept. 1 on the construction of its 20-mile electric railway between Yorkville and Morris. Capital stock, authorized, \$300,000. Officers: H. H. Evans, president; John Meredith, vice-president; Ralph Putnam, secretary; A. R. Evans, treasurer, and F. M. Zimmerman, chief engineer, all of Aurora. [E. R. J., Nov. 19, '11.]

\***Hillsboro, Ill.**—A survey is being made for an electric railway from Hillsboro to Taylor Springs. The line, it is said, will be financed by the Hillsboro Electric Light & Power Company.

**The Ft. Wayne & Springfield Traction Company, Portland, Ind.**—This company is securing rights-of-way and preparing to let a contract for the construction of an electric railway from Springfield to Portland.

**Vincennes, Washington & Eastern Interurban Company, Vincennes, Ind.**—Surveyors for this company made soundings Aug. 1, in White River, to locate the position for the bridge across the river. It is understood the bridge will be let as a separate contract. [E. R. J., Aug. 5, '11.]

**Albia (Ia.) Interurban Railway.**—This company will soon build an extension to Buxton.

**Louisville (Ky.) Railway.**—Surveys have been made by this company for a line between Ornell and Kosmodale. Ultimately the Orell road will be built on to West Point.

**Owensboro (Ky.) City Railway.**—This company has announced plans for improvements of various kinds which are to be made during the next few months. Several thousand dollars has been appropriated for the purpose of bettering the system.

**Athens, Maine.**—The proposed 10-mile electric railway

from Skowhegan, via East Madison to Athens, is claimed by Athens people to be assured. The towns of Athens and Skowhegan have each voted to take \$15,000 in stock, and the Maine Central Railroad has promised an equal amount. The proposal is to issue \$75,000 stock and provide the rest of the funds by the sale of bonds. J. E. Chapman is interested. [E. R. J., Aug. 20, '11.]

**United Railways & Electric Company, Baltimore, Md.**—This company is constructing some double track on lines in Baltimore.

**Berkshire Street Railway, Pittsfield, Mass.**—Work has been begun by this company on its extension from Ashley Falls to Canaan.

**Battle Creek, Coldwater & Southern Railway, Battle Creek, Mich.**—This company has not awarded the contract to the J. T. Adams Construction Company for the construction of its proposed railway between Battle Creek and Coldwater, as was stated in the ELECTRIC RAILWAY JOURNAL for July 29, 1911.

**Interurban Construction Company, Hastings, Minn.**—This company will begin construction of its interurban road from St. Paul to Hastings immediately. [E. R. J., May 27, '11.]

**St. Louis, St. Charles & Northern Traction Company, St. Louis, Mo.**—This company plans to build an extension from Paris to St. Louis. Work has been begun on the main line and probably will begin on the extension this fall. [E. R. J., Feb. 6, '09.]

**Columbia Falls & Southern Railroad, Columbia Falls, Mont.**—Surveys have been completed and most of the right-of-way has been secured by this company for its 26-mile railway between Columbia Falls, Jessup and Big Fork. A. L. Jordan, Columbia Falls, president. [E. R. J., July 22, '11.]

**New York City (N. Y.) Interborough Railway.**—Work has been begun by this company on its Hunt's Point crosstown line from Randall Avenue to Intervale Avenue, in New York.

**New York, Westchester & Boston Railway, New York, N. Y.**—Stockholders of the Harlem River & Portchester Railroad will hold a special meeting on Sept. 8, to consider a contract with the New York, Westchester & Boston Railway for joint construction and operation of the railroads of the companies from the Harlem River to One Hundred and Seventy-fourth Street, New York, and for the perpetual use by the latter railway of two tracks of the Harlem River & Portchester Railway.

**Syracuse, Watertown & St. Lawrence River Railway, Syracuse, N. Y.**—Application has been made by this company to the Public Service Commission to issue \$120,000 capital stock and \$225,000 of 5 per cent bonds to pay the cost of constructing 6½ miles of its railway from stop No. 9, on the Syracuse & South Bay Electric Railway, to Brewster, on the shores of Oneida Lake. [E. R. J., July 22, '11.]

**North Carolina Public Service Company, Greensboro, N. C.**—Work has been begun by this company on its 1½-mile extension of its High Point line.

**Tidewater Power Company, Wilmington, N. C.**—This company advises that it will build 1 mile of double track in Wilmington.

**Bellefontaine & Sidney Traction Company, Bellefontaine, Ohio.**—Interest has again been revived in this proposed electric railway to connect Bellefontaine, Columbus and Sidney. Right-of-way is being secured. Hugh T. Mathers, Sidney, president. [E. R. J., May 1, '09.]

\***Clinton, Okla.**—A company is being formed in Clinton to build an electric railway between Clinton, Taloga, Thomas and Watonga.

**El Reno (Okla.) Interurban Railway.**—Surveys are being made by this company on the 12-mile extension from Yukon to El Reno. One of the surveys is west of El Reno and two are to the northwest of El Reno. It is understood that this company expects to build a line to Richland and then turn into El Reno over the Ft. Smith & Western Railroad tracks, the latter company in turn using the interurban tracks into Oklahoma City.

**People's Electric Railway, Muskogee, Okla.**—This company has received permission from the Government to pro-

ceed with the construction of a bridge across the Arkansas River. A company to build the bridge has been formed with a capitalization of \$10,000. The incorporators are Reuel Haskel, Ira D. Millinax and George W. Risser, all of Oklahoma City. [E. R. J., April 15, '11.]

**\*London, Ont.**—A proposed electric railway is being discussed to extend from Toronto to London, with connections to St. Thomas. A. H. Campbell, of Toronto, is reported to be interested.

**North Midland Railway, London, Ont.**—A. E. Welch, London, announces that financial arrangements have been completed for the construction of this line from London to St. Mary's, with a branch line to Granton. Construction work will begin this fall, and hydroelectric power will be obtained from the St. Mary's municipal substation. [E. R. J., Jan. 16, '09.]

**Morrisburg & Ottawa Electric Railway, Ottawa, Ont.**—This company plans to begin the construction of its electric railway from Ottawa to Morrisburg in the fall.

**Toronto, Ontario.**—The subway committee of the City Council, Toronto, is to have specifications prepared for the proposed Teraulay subway with a view to calling for bids about Sept. 15. According to the plans prepared by the engineer, E. L. Cousins, Toronto, the subway will start at the corner of Front Street and Bay Street, adjoining the proposed new Union Station, and will run due north under Bay Street, Teraulay Street and North Street, up to Davenport Road, diverging to the east so as to reach the present level of the east end of Ramsden Park.

**Portland, Eugene & Eastern Railway, Portland, Ore.**—The entire holdings of the Corvallis & Alsea River Railway have been bought by this company, including 31 miles of right-of-way track terminals at Corvallis, rolling stock, etc. The Portland, Eugene & Eastern Railway, it is reported, will electrify 18 miles of the line from Corvallis to Monroe, and then extend the line from Monroe to Eugene, a distance of 22 miles. Power for operation of the new line will be furnished by the Oregon River Power Company.

**Southern Cambria Railway, Johnstown, Pa.**—This company has completed grading its extension to Ebensburg, and the work on the overhead construction and track laying has been begun.

**West Penn Railways, Pittsburgh, Pa.**—The contract for the erection of the steel bridge over Cats Run, on the Masontown-Morgantown extension of this railway, now being constructed, was let to the John Eichlasy, Jr., Company, of Pittsburgh.

**Knoxville Railway & Light Company, Knoxville, Tenn.**—This company has begun work double-tracking its line from Broadway to the city limits of Knoxville.

**Nashville-Gallatin Interurban Railway, Nashville, Tenn.**—Carmichael & Spradlin has been awarded the contract by this company to grade the 12-mile section between Gallatin and Saundersville. H. H. Mayberry, Nashville, president. [E. R. J., July 29, '11.]

**Austin (Tex.) Street Railway.**—This company will award contracts during the next month for building and repaving about ½ mile of new track in Austin.

**Beaumont (Tex.) Traction Company.**—Work has been begun by this company on the double-track construction of several lines in Beaumont. The company will spend \$125,000 on the track construction and about \$20,000 repaving some of its lines.

**Dallas (Tex.) Consolidated Electric Street Railway.**—The double-tracking of several of its lines in Dallas is being planned by this company.

**Northern Texas Traction Company, Ft. Worth, Texas.**—This company will double-track its Evans Avenue line.

**\*Sherman, Tex.**—C. B. Dorchester and J. F. Etter plan to build an electric railway from Sherman to Paris, via Bonham and Honey Grove.

**Belton & Temple Traction Company, Temple, Tex.**—Surveys are being made by this company to shorten its line between Belton and Temple.

**Southwestern Traction Company, Temple, Tex.**—This company advises that it has placed all orders, and material is arriving for the construction of 1 mile of new track in Temple.

**\*Urbana, Va.**—Plans are being made to organize a company to build an electric railway between Urbana, West Point and Richmond, crossing the Mattaponi River. T. M. Carrington and William T. Dabney are interested.

**Tyler Traction Company, Clarksburg, W. Va.**—This company has awarded the contract to Messrs. Board & Reed, Charlestown, W. Va., for the construction of its line between Sistersville and Middlebourne. H. W. McCoy, president. [E. R. J., Aug. 12, '11.]

**Badger Railway & Light Company, Milwaukee, Wis.**—Most of the right-of-way has been secured by this company on its 22-mile railway between Lake Geneva, Elkhorn and Whitewater. The company is considering plans to extend the line to Ft. Atkinson. Gustav Pickhardt, Milwaukee, chief engineer. [E. R. J., July 8, '11.]

**Waupaca Electric Light & Railway Company, Waupaca, Wis.**—This company advises that during the next few weeks it will place contracts for the construction of several extensions of its lines in Waupaca. One branch will be built to the Wisconsin Veterans' Home and the other to the Waupaca-Green Bay Railway.

#### SHOPS AND BUILDINGS

**British Columbia Electric Railway, Vancouver, B. C.**—This company has awarded the contract for the construction of a new freight house at the foot of Carrall Street, Vancouver, near False Creek, to D. Matheson, Vancouver. The building is to measure 30 ft. x 167 ft., and will be used in connection with the existing freight shed for the inter-urban freight traffic of the company.

**Illinois Traction System, Champaign, Ill.**—This company is now building a temporary passenger station on the block bounded by Twelfth Street, High Street, Lucas Avenue and Lind Street in St. Louis. It will be a two-story structure of brick and cement construction and will cover about three-fourths of the block. The cost will be about \$20,000.

**Indiana Union Traction Company, Anderson, Ind.**—This company and the Ft. Wayne & Wabash Valley Traction Company have entered into an agreement for maintaining a new passenger and freight station in Bluffton. A contract has been signed by which a portion of the opera house block is to be used.

**Kentucky Traction & Terminal Company, Lexington, Ky.**—This company will build an ice factory in connection with its new power house in Lexington. The cost of the entire plant will be \$500,000. Work will begin in a few weeks and it will be ready for use early next spring.

**Citizens Railway, Lincoln, Neb.**—This company's carhouse at Twenty-fifth Street and D Street in Lincoln, and used as a storage house by the Lincoln Traction Company, was destroyed by fire. The loss is estimated to be about \$20,000.

**Public Service Corporation, Newark, N. J.**—Plans are being made by this company to build a waiting station on Hillside Road and Palisade Avenue in West Hoboken.

**Northern Ohio Traction & Light Company, Akron, Ohio.**—A new station and train shed will be constructed by this company on North Main Street in Akron in the near future.

**People's Electric Railway, Muskogee, Okla.**—Work has been begun by this company on the construction of its five-story terminal building at the corner of C Street and Callahan Street in Muskogee. [E. R. J., April 15, '11.]

**Berlin & Waterloo Street Railway, Berlin, Ont.**—This company advises that it will extend its carhouse to accommodate new rolling stock and install a hydraulic motor lift.

**Seattle, Renton & Southern Railway, Seattle, Wash.**—This company expects to build an addition to its carhouse at Columbia Station in Seattle. It will also build new foundations under the present buildings.

**Sheboygan Light, Power & Railway Company, Sheboygan, Wis.**—Construction will be begun at once by this company on its new carhouses at South Eighth Street and Clara Avenue, in Sheboygan.

**Twin City Electric Company, South Bend, Wash.**—Plans are being made by this company to build station waiting rooms along the route between South Bend and Raymond. Its new carhouse will be constructed midway between South Bend and Raymond.

## POWER HOUSES AND SUBSTATIONS

**Aurora, Elgin & Chicago Railroad, Chicago, Ill.**—This company contemplates the installation of a coal-handling and coal-storage plant at its Batavia power house.

**Chicago (Ill.) Railways.**—The Westinghouse Electric & Manufacturing Company has received a contract from this company for equipment for the extension of its La Salle Street substation, including two 3000-kw, 25-cycle, self-starting rotary converters, with the necessary transformers, and a ten-panel switchboard.

**Des Moines (Ia.) City Railway.**—Plans are being considered by this company to build a one-story brick addition to its power plant in Des Moines.

**Southwestern Traction & Power Company, New Orleans, La.**—During the next ten weeks this company will place contracts for the construction of a new power house in New Iberia. The company expects to purchase two 250-hp. water tube boilers, turbines, generators, etc. It will use fuel oil under the boilers.

**Omaha & Council Bluffs Street Railway, Omaha, Neb.**—This company will rebuild at once its substation on the Manawa line. The building was recently destroyed by lightning.

**The Delaware & Hudson Company, Albany, N. Y.**—This Company has placed an order with the General Electric Company for one 7500-kw turbine, one 100-kw turbo-exciter and four 2500-kva transformers. This apparatus will increase the power supply of the company's electric railway interests in Albany, Troy and Schenectady, and will also furnish power for the company's new shops at Watervliet, N. Y.

**International Railway, Buffalo, N. Y.**—This company has awarded the contract to the General Electric Company for two 1000-kw rotary converters, with transformers and switchboard.

**Tidewater Power Company, Wilmington, N. C.**—This company has ordered a 2000-kw turbo-generator and condenser for its power house in Wilmington.

**Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio.**—This company will place contracts during the next six weeks for an additional compound steam engine or turbine unit in its power plant in Bowling Green, and will probably install an automatic stoker.

**Ohio Valley Electric Railway, Cincinnati, Ohio.**—This company will erect an addition to its power house at Kenova, W. Va.

**Youngstown & Southern Railway, North Lima, Ohio.**—This company's depot and substation, at North Lima, was destroyed by fire on Aug. 2, with a loss of \$30,000.

**Berlin & Waterloo Street Railway, Berlin, Ont.**—This company advises that it has let the contract to the Gould Storage Battery Company to rebuild its storage battery reserve.

**Mount Hood Railway, Light & Power Company, Portland, Ore.**—This company will build a two-story reinforced concrete substation, at the foot of Williams Avenue, Portland. The cost is estimated to be about \$60,000.

**Lynchburg Traction & Light Company, Lynchburg, Va.**—This company advises that it has just completed the installation of a 1000-kw. Curtis turbine at its power house in Lynchburg.

**Bellingham-Skaget Interurban Railway, Bellingham, Wash.**—This company has begun work at Mount Vernon, clearing a site for its new substation and car yards. The construction of an 800-ft. trestle and a bulkhead will also be undertaken by the company.

**Twin City Electric Company, South Bend, Wash.**—The power house of this company will be located midway between South Bend and Raymond.

**Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis.**—This company will build a brick addition to its power plant on North Main Street and Rees Street, in Fond du Lac, and will install new stoking apparatus.

**Milwaukee Electric Railway & Light Company, Milwaukee, Wis.**—Work has been begun by this company on the foundations for a new substation at Twentieth Street and North Avenue, in Milwaukee.

## Manufactures &amp; Supplies

## ROLLING STOCK

**San Luis & Potosi (Mex.) Electric Railway** has ordered twenty single-truck cars from the St. Louis Car Company.

**Detroit (Mich.) United Railway** is reported to have ordered fifty city cars from the G. C. Kuhlman Car Company.

**Dayton & Troy Electric Railway, Tippecanoe City, Ohio,** expects to purchase a double-truck snow sweeper and four heaters.

**Elmira Water, Light & Railroad Company, Elmira, N. Y.,** expects to change ten double-truck cars to the pay-as-you-enter type.

**Jacksonville (Fla.) Electric Company** has ordered from the St. Louis Car Company ten cars of the Birney semi-steel type.

**Montreal (Que.) Street Railway** has ordered ten steel pay-as-you-enter car bodies from the Canadian Car & Foundry Company, Ltd.

**Waupaca Electric Light & Railway Company, Waupaca, Wis.,** is in the market for two side dump cars, having about eight to ten tons' capacity, for coal-hauling purposes.

**St. Louis & Jennings Railway, St. Louis, Mo.,** has ordered twenty-two double-truck cars from the St. Louis Car Company for use on its new line now in course of construction.

**Missouri & Kansas Interurban Railway, Overland Park, Kas.,** expects to purchase a refrigerator compartment dairy and farm produce car for express service between Olathe and Kansas City.

**Central Pennsylvania Traction Company, Harrisburg, Pa.,** noted in the *ELECTRIC RAILWAY JOURNAL* of Aug. 5, 1911, as considering the purchase of several cars, has ordered six pay-within cars from The J. G. Brill Company.

**Lynchburg Traction & Light Company, Lynchburg, Va.,** has ordered six 43-ft., semi-convertible, pay-as-you-enter cars from The J. G. Brill Company. The cars will be equipped with four G.E.-80 motors and Westinghouse air brakes.

## TRADE NOTES

**American Car & Foundry Company, St. Louis, Mo.,** has bought about 200 acres of land in Gary, Ind., where it is planning to erect a car-building plant to cost \$10,000,000. About 6000 men will be employed.

**Lagonda Manufacturing Company, Springfield, Ohio,** has had its automatic cut-off valve admitted to the Museum of Safety Devices, 29 West Thirty-ninth Street, New York. This valve is so made as to close automatically if a break occurs on either side of the valve.

**Whipple Supply Company, New York, N. Y.,** reports that the Tool Steel Gear & Pinion Company, for which it is selling agent, has obtained an order from the Chicago Railways Company for 1000 specially hardened and toughened gears and 1000 pinions, for application to new equipment.

**United States Electric Company, New York, N. Y.,** has received an order from the Baltimore & Ohio Railroad for Gill selector telephone train dispatching outfits complete for forty stations, to be used in the extension of its telephone dispatching circuits from Clarksburg to Salem, W. Va.

**Le Moyne L. Parkinson, Pittsburgh, Pa.,** has resigned his position with the Standard Underground Cable Company, of that city, to become district sales manager of the Esterline Company, of Lafayette, Ind. Mr. Parkinson will have charge of the State of Michigan, having his office at Detroit.

**W. R. Kerschner, New York, N. Y.,** has recently received two orders for the Cincinnati Car Company, one being an order for five 20-ft. car bodies for the Altoona & Logan Valley Electric Railway, the other an order for three 30-ft. 8-in. car bodies mounted on Standard O-50 trucks for the Conestoga Traction Company.

**Kellogg Switchboard & Supply Company, Chicago, Ill.,** has closed a contract with the Mount Hood Railway & Power Company, Portland, Ore., for a telephone system for its 29-mile electric railway extending to Bull Run. Dispatchers' and way-station equipment and Gill selectors are called for by the specifications.

**Allis-Chalmers Company, Milwaukee, Wis.**, has announced that its Scranton plant will be entirely closed down by Jan. 1, 1912, and that the hydraulic department will be taken to Milwaukee and the sugar machinery department to Chicago. C. L. Glasgow has been appointed Montreal district sales manager of Allis-Chalmers-Bullock, Ltd. Mr. Glasgow has had extensive experience in the construction of electric railways and the design of power plants.

**F. B. DeGress**, for over ten years New York district manager, Crocker-Wheeler Company, has resigned to assume the position of general sales manager, Pulsometer Company, 17 Battery Place, New York City. Besides looking after the sales end of the business Mr. DeGress is also carrying on a series of experiments with a view to improving certain features of the pulsometer in order to make it suitable for general pumping work in power plants, industrial establishments, etc.

**Federal Storage Battery Car Company, New York**, has purchased a large factory at Silver Lake, N. J., near West Orange, and in the future will manufacture at these shops car bodies, motors and all other equipment required for its storage battery cars, except the Edison storage battery, which will still be manufactured at the Edison plant at West Orange. The new shops are so arranged that they can easily be enlarged to secure any capacity desired. On Aug. 19 the company will move its principal office to these works and thereafter its address will be Franklin Street, near Belmont Avenue, Silver Lake, N. J.

**Western Electric Company, New York, N. Y.**, reports that its gross sales for July show a falling off of 3 per cent. as compared with July, 1910, but the seven months of the current fiscal year which have elapsed are 4 per cent ahead of the corresponding period of last year. It now seems unlikely that the company will realize its earlier prospects of a \$71,000,000 year, but the showing to date, which is at the rate of \$66,000,000 for the year, is close behind the company's high record of \$69,000,000 for 1906. The Western Electric Company is employing 26,000 persons as compared with 29,000 in 1906, which was the largest number ever on the company's books at any one time.

#### ADVERTISING LITERATURE

**J. A. Nelson, New York**, has issued a little treatise on "Bearings," giving some forty questions and answers on anti-friction bearings. It is sold for 10 cents a copy.

**Browning Engineering Company, Cleveland, Ohio**, has issued a 55-page catalogue of locomotive cranes, showing the various uses to which they can be put to advantage.

**A. Stucki Company, Pittsburgh, Pa.**, has published an illustrated bulletin showing the advantages to be derived by the use of Stucki side bearings on steam railroad freight and passenger cars and electric cars.

**Chicago Railway Equipment Company, Chicago, Ill.**, has published a pamphlet entitled "The Brake Beam," which contains a comprehensive discussion of air-brake mechanism, with special reference to the Creco brake beam.

**Kerr Turbine Company, Wellsville, N. Y.**, has issued Catalog No. 19, which is a treatise on the theory, construction, uses and advantages of small Kerr steam turbines for driving generators, pumps, blowers and other small high-speed machines. The catalog contains numerous data and illustrations.

**Electric Railway Improvement Company, Cleveland, Ohio**, has published an illustrated pamphlet describing its well-known methods of electric bond welding. Among the new features are descriptions of apparatus developed for the electric welding of third-rail and of track on 1200-volt overhead conductor systems. This process is also adapted to the installation of large cables around special work.

**Hayes Track Appliance Company, Richmond, Ind.**, has issued Circular No. 64, illustrating the extensive use of Hayes derrails on the Southern Pacific Railway. The circular mentions the use of Hayes derrails in connection with automatic block signals on the Harriman lines and illustrates some details of practice on this system.

**Electric Service Supplies Company, Philadelphia, Pa.**, has published a fifty-page catalog and price list of Protected rail bonds, bonding tools and rail bond testing sets. The

company has also issued Bulletins Nos. 48, 49, 51, 53, 54, 55 and 56, giving complete descriptions of the different types of Garton-Daniels lightning arresters and accessories for direct and alternating-current circuits.

**Gould Storage Battery Company, New York, N. Y.**, has issued a twelve-page bulletin, entitled "The Electrical Installations in the Detroit River Tunnel Plant." This bulletin describes the Gould battery and allied regulating apparatus by means of which current from the Detroit Edison Company's plant is used to pull the trains of the Michigan Central Railroad through the new Detroit River Tunnel.

**James Beggs & Company, New York, N. Y.**, have issued a sixteen-page catalog on the Blackburn-Smith pressure filter. This filter consists of small, easily removable and renewable cloth-covered cartridges for removing suspended matter from hot or cold water, and is useful in the clarification of a murky water supply, removing oil and slime from boiler water or for clarifying the water in processing systems.

**Allis-Chalmers Company, Milwaukee, Wis.**, has issued Bulletins Nos. 1512, 1080 and 1623. Bulletin No. 1512 contains a description of various types of compound Corliss engines, together with illustrations which show their adaptability to many different uses. Bulletin 1080 describes various types of alternating-current generators and supercedes Bulletin No. 1048. Bulletin No. 1623 is an engineering description of the Priests Rapids development of the Hanford Irrigation & Power Company.

**Bates Machine Company, Joliet, Ill.**, has issued a twenty-four-page catalog which describes and illustrates Cookson cast-iron heaters and receivers with cut-out valves. This type of heater serves as a purifier, filter, oil separator and condensation receiver, and possesses the special feature of being able to purify all the exhaust steam from the engines and auxiliaries.

**Western Electric Company, New York, N. Y.**, has issued Bulletin No. 1105, on the selection, installation and wiring of inter-phone systems. Two new systems are shown, one a selective-ringing, common-talking set, made in both four and eight-button types to accommodate five and nine-party service, the other a selective-ringing, common-talking set for limited service. This limited service is one where, from a master station, a call may be made to any outlying station, and the master station may in turn be called from any outlying station. In addition to these new sets, all the standard sets manufactured by the company, together with accessories and supplies necessary for the complete installation of inter-phone systems, are shown.

**Titanium Alloy Manufacturing Company, Pittsburgh, Pa.**, has issued a 40-page catalog on titanium alloy rails, giving the results of service tests on a number of steam railroads. Titanium steel rails, which have been in use on sharp curves and sections subjected to heavy traffic for periods of from two to three years, show much better wearing qualities than the best untreated carbon steel. Among the electric railways which have purchased titanium steel rails in quantities of 500 tons or more may be mentioned the Pittsburgh Railways, 2871 tons; Metropolitan Street Railway, New York, 700 tons; Rochester Railway, 500 tons; United Railroads of San Francisco, 500 tons. The catalog is profusely illustrated with sections of rails after service tests and views of titanium rails in the track.

**Electric Service Supplies Company, Philadelphia, Pa.**, has just issued Vol. I of Catalog No. 4 describing exclusively its overhead line and track supplies. The present volume numbers 700 pages and is substantially bound in cloth. This edition is notable for the additional data on catenary line material, such as diagrams of hanger lengths and pole spacing in addition to detailed descriptions of individual catenary parts. Much attention is also given to electric block signals, highway crossing signals, signal bells and buzzers and telephones, which are especially adapted for dispatching. The catalog also includes references to a great many devices used for the construction, testing and operation of electric railways. The book is concluded with elaborate indexes of code words, and list numbers of the material described.