

# Electric Railway Journal

A CONSOLIDATION OF

Street Railway Journal and Electric Railway Review

VOL. XXXVII.

NEW YORK, SATURDAY, JUNE 10, 1911

No. 23

PUBLISHED WEEKLY BY

## McGraw Publishing Company

239 WEST THIRTY-NINTH STREET, NEW YORK

JAMES H. MCGRAW, President.

HUGH M. WILSON, 1st Vice-President. A. E. CLIFFORD, 2d Vice-President

CURTIS E. WHITTLESEY, Secretary and Treasurer.

TELEPHONE CALL: 4700 BRYANT. CABLE ADDRESS: STRYJOURN, NEW YORK.

HENRY W. BLAKE, Editor.

L. E. GOULD, Western Editor.

Associate Editors:

RODNEY HITT, FREDERIC NICHOLAS, WALTER JACKSON.

News Editors:

G. J. MACMURRAY, FRANK J. ARMEIT.

CHICAGO OFFICE.....1570 Old Colony Building  
CLEVELAND OFFICE.....1021 Schofield Building  
PHILADELPHIA OFFICE.....Real Estate Trust Building  
EUROPEAN OFFICE....Hastings House, Norfolk St., Strand, London, Eng.

### TERMS OF SUBSCRIPTION:

For 52 weekly issues, and daily convention issues published from time to time in New York City or elsewhere: United States, Cuba and Mexico, \$3.00 per year; Canada, \$4.50 per year; all other countries, \$6.00 per year. Single copies, 10 cents. Foreign subscriptions may be sent to our European office.

Requests for changes of address should be made one week in advance, giving *old* as well as new address. Date on wrapper indicates the month at the end of which subscription expires.

### NOTICE TO ADVERTISERS.

Changes of advertising copy should reach this office ten days in advance of date of issue. New advertisements will be accepted up to Tuesday noon of the week of issue.

Copyright, 1911, by MCGRAW PUBLISHING COMPANY.

Entered as second-class matter at the post office at New York, N. Y.

*Of this issue of the ELECTRIC RAILWAY JOURNAL 8500 copies are printed.*

NEW YORK, SATURDAY, JUNE 10, 1911.

### CONTENTS.

The Railway Mechanical Conventions.....	1001
The Rapid Transit Situation in New York.....	1001
Electric Light and Electric Railway Business.....	1002
Electric Operation on the Long Island Railroad.....	1002
Morning Sessions at the Electric Railway Convention.....	1003
Car Equipment Inspection and Maintenance on Long Island Railroad.....	1004
New 82-Ton Electric Locomotive of the Northern Electric Railway.....	1011
Pole Lines of the Pennsylvania Railroad Across Hackensack Meadows.....	1014
Pennsylvania Commission Report of the Philadelphia Rapid Transit Company.....	1016
Papers Presented Before the Pacific Claim Agents' Association.....	1022
Receivers for Metropolitan Street Railway, Kansas City.....	1024
Brief of Company in Milwaukee Low-Fare Case.....	1025
Hearing in Regard to Interpretation of New Jersey Law.....	1026
Division of Five-Cent Fare in New York State.....	1027
Papers Read at National Electric Light Association Convention.....	1027
Report of Indiana Railroad Commission on Signals Delayed.....	1028
The Letter Ballot on Standards.....	1028
Aerial Monorailway.....	1028
Reheater for Speed-Roll Insulator.....	1028
New Lighting Transformers.....	1029
Spoke Type Steel Wheels.....	1029
Double-Truck City Cars for Boise & Interurban Railway.....	1029
Outing Car of the Detroit United Railway.....	1030
Automatic Section Insulators.....	1030
Charcoal Cones for Grounding.....	1030
News of Electric Railways.....	1031
Financial and Corporate.....	1034
Traffic and Transportation.....	1037
Personal Mention.....	1039
Construction News.....	1040
Manufactures and Supplies.....	1043

### The Railway Mechanical Conventions

The programs of the annual conventions of the Master Car Builders' and Master Mechanics' Associations, which will be held this year at Atlantic City, June 14-21, do not include committee reports or individual papers on any subjects relating especially to electric railway practice. But the sharp line which in the past was drawn between steam and electric railway rolling stock is rapidly disappearing, and every electric railway officer who can attend these conventions will find many things of interest and value to him in the discussions at the meetings and in the elaborate exhibit of railway appliances which will be made. The steady growth of interurban freight traffic and the developments in heavy electric traction are bringing the steam and electric railways closer together in their relations with each other, as witnessed by the admission of several electric interurban roads to membership in the American Railway Association and the active participation of representatives of electrified steam roads in the affairs of the American Electric Railway Association. Electric railways which are anxious to extend their freight operations must keep in touch with the Master Car Builders' rules and standards relating to interchange of equipment and be prepared to follow them. In the design and operation of electric locomotives many lessons can be learned from the ripe experience of the men long in charge of steam locomotive equipment. Such matters as third-rail and overhead trolley clearances are of mutual interest to steam and electric railways. Attendance at these June conventions affords the electric railway engineer an excellent opportunity of becoming acquainted with the point of view of steam railway men and of keeping in touch with new developments in their field which sooner or later may affect the construction and operation of electric railway equipment.

### The Rapid Transit Situation in New York

At the time of going to press with this issue the exact terms of the report of the committee of the Board of Estimate on rapid transit facilities in New York had not been published, but they are said to provide entrance to Manhattan as far as Fifty-ninth Street and several extensions in Brooklyn for the Brooklyn Rapid Transit Company, while the Interborough Rapid Transit Company is to get its upper east-side and lower west-side lines, extensions in the Bronx and in Brooklyn, and the right to build third-tracks on its elevated lines in Manhattan not so equipped at present. The financial terms under which these extensions are to be allowed are also not yet known, so that it is impossible to determine whether the companies will find such lines profitable, but on the assumption that these terms are not too arduous the proposed plan seems very attractive. At last a comprehensive rapid transit system has been seriously proposed by the city authorities! As so

far outlined the plan does not permit a trip from the Bronx to Coney Island for 5 cents, but this is not needed and it would be unfair to the other travelers in New York to provide it. The extent of the proposed lines has given rise to fear in some quarters that the city will be overprovided with rapid transit facilities, but we have no apprehension on this point. By the time that the lines are built we believe that they will be overcrowded, not perhaps to the same extent as the present subway, but so much so as then to require new transit facilities. The only danger now is that there will be a deadlock between the city authorities and one or both of the railway companies as to the terms for the franchises. The Interborough Rapid Transit Company at present is in a very strong position, owning as it does the right for many years to the best single rapid transit route in Manhattan. We trust that the city authorities will realize this situation and will not, in their effort to secure "good terms," sacrifice the far more important demands of the city for rapid transit service. On the other hand, we are equally anxious to see both companies meet the city on the broadest possible basis, and hope that they will realize that the development and prosperity of the city are intimately associated with their own business prosperity.

#### Electric Light and Electric Railway Business

A marked feature of the convention of the National Electric Light Association last week and of the general tone of the conversation of those in attendance was a general optimism for the future. This fact, accompanied as it is with evidence that it has become more easy to interest financial houses in new electric lighting enterprises than in new electric railway undertakings, suggests the inquiry as to the reasons for this difference. At first sight the two lines of business would seem to be very closely allied and to be affected by the same political and economical conditions. But further consideration shows a number of striking points of contrast to which the difference in financial status, if such exists, may probably be attributed. In the first place, it is probable that the lighting industry has been less affected than the railway business by the large increased cost of labor which has occurred during the last few years. In the second place, a lighting company has a better control over the rates which it charges. With the railway a change of rate is almost always out of the hands of the management and even out of those of a public service commission. Nearly always, by statute or charter, the railway rate within city limits is fixed irrespective of the service rendered and can never be more than 5 cents, and may be a much lower sum, depending upon the extent to which passengers use transfers; in the lighting industry the net profit for the different classes of service may be calculated to a nicety. In railway work again the erection of every tall office building in a city means greater street congestion and slower speed, and the extension of the city limits is equivalent to the extension of the ride which must be given for a 5-cent fare. In the electric lighting industry these evidences of a city's growth are simply opportunities for increased business at a profitable rate. Finally there have undoubtedly been more technical improvements in the lighting industry during the last few years than in the railway business. The introduction of the metallic-filament lamp with its high efficiency has been a tremendous stimulus to the use of illumination, and while the immediate effect may have been to reduce the

demand for central-station current, practically all thoughtful observers are agreed, we believe, that the net effect already has been very beneficial to the electric lighting business. Concurrently, also, there has been a more general adoption of electric current for light and heavy power uses, as the convenience and economy of electric power for various households and industrial purposes have become more apparent. Both branches of the electrical industry have received the benefit of the improvements in generating apparatus, but in railway work there have not been the same radical improvements from invention as in other branches of the service.

#### ELECTRIC OPERATION ON THE LONG ISLAND RAILROAD

The Long Island Railroad was the first railroad in the United States to substitute electric traction for steam on a large scale. The success of the experiment was immediate, and from the standpoints of economy, reliability and traffic productivity electric operation has more than come up to expectations. It is now six years since the first of the electric lines, from Flatbush Avenue, Brooklyn, to Rockaway Park, a distance of 13.5 miles, was opened for traffic. Since 1905 the route mileage of the electric lines in operation has been increased to 62 miles, 100 trains a day in each direction are being run through the East River tunnels in and out of the new Pennsylvania terminal station, and the commuter traffic has increased from an average of 6387 passengers daily to 11,869 passengers. The three elements of a system of electric traction which do not enter into steam railroad operation are the power generating apparatus, the transmission and distribution network and the electric motor cars or locomotives which propel the trains. The generation of electric power in central stations has reached a stage of efficiency and reliability far beyond that of individual steam locomotive power units. The transmission and distribution of electricity through overhead trolley wires or third rails involves no special difficulties in the matter of reliability or cost of upkeep. To the steam railroad man the most important consideration in comparing steam and electric operation is the relative performance of electric motor cars or locomotives and steam locomotives. An electric motor car with its brakes, control and other auxiliary apparatus may seem complicated to one unfamiliar with the purpose of each part. But the fact remains that the electrical equipment of a motor car performs its functions with remarkable reliability, and practically all of it is not only damage-proof but fool-proof.

On another page in this issue will be found an extended description of the electric equipment, inspection and maintenance methods of the Long Island Railroad, which concludes with a summary of failures and the train delays caused thereby for the year 1910. The number of failures and the total delays for the year may impress the reader at first as large, but they amount to less than one failure per day, or averaged throughout the year the delays were but seven minutes a day, with an average daily train movement of 5340 miles. A comparison of steam passenger locomotive failures for the whole Long Island Railroad system with the electric car failures shows the greater reliability of the electric equipment. If the comparison were made on the basis of motive power equipment alone, excluding from the electric train column all delays due to failures of trucks, bodies or body brake gear, approximately seventy-

five delays for a total of 740 minutes, the comparison would be still more favorable to the electric equipment. In this connection it is interesting to note that the New Haven a.c.-d.c. locomotives during the last six months of 1909 made 11,100 miles per failure, while the steam passenger locomotives on the same road made only 4750 miles per failure.

The economy of electric operation for heavy suburban traffic, such as the Long Island Railroad carries on its western lines, was clearly shown in the report on electric traction by George Gibbs, presented last year at the International Railway Congress. In 1908 the Long Island operated its electric trains at a cost of 17.80 cents per car mile as compared with 27.95 cents for its former steam service. In the matter of repairs to rolling stock equipment the electric service cost much less than steam. Assuming a three-car train composed of two motor cars and a trailer, the cost of inspection, cleaning and maintenance per 100 train miles was \$6.10 in 1910. The cost of the same item for a steam train of the same make-up was more than \$11.

The secret of successful operation of electric equipment such as is owned by the Long Island Railroad is thorough and systematic inspection and prompt remedying of minor defects which are found. The cost is not excessive—in fact, it is less than the cost of car cleaning—but its value cannot be overstated. The failures of the electric apparatus usually are of minor importance, and they can be prevented in a large measure by careful inspection, cleaning and adjustment. The motormen cannot be depended upon to find and remedy troubles developed on the road without incurring long delays and possibly seriously damaging the equipment in their effort to keep the trains moving.

---

#### MORNING SESSIONS AT THE ELECTRIC RAILWAY CONVENTION

---

In arranging the program of the electric railway convention it has been the custom in the past to provide for morning and afternoon sessions of one or more associations on four out of the five days. Last year the five associations held twenty-one sessions in all, and of this number eight sessions were in the afternoon. With the exception of the American Association, which held no morning sessions, it was noticeable that at the afternoon sessions the associations were invariably late in getting down to business, that the attendance was smaller than at the morning sessions and the interest taken in the discussions was less. By Thursday afternoon the work of the convention was practically over, yet the Engineering Association in order to finish its long program was obliged to have two sessions on Friday, after most of the other convention visitors had left for their homes. We venture the suggestion that the convention work of all of the associations would be expedited and interest in the discussions would be maintained to a greater extent throughout the week if the program this year could be arranged so as to provide more morning sessions and fewer afternoon sessions, especially after the first day.

A session on Monday morning would be inconvenient because that is the time at which most of the delegates arrive, and the hours before luncheon are necessary to allow delegates to get settled at their hotels and to register. Hence Monday afternoon could well be utilized for the transaction of the

routine business of the opening sessions of each of the four affiliated associations. Then on Tuesday morning the presentation of papers and committee reports and the discussion thereon could be begun without delay. It would then be necessary only to lengthen out the morning sessions somewhat during the succeeding three days in order to dispose of all matters which might be brought up for discussion. The Engineering Association met last year on Tuesday, Wednesday and Friday and held two sessions on each day. With the larger number of reports this year it probably would require, if it held an opening session on Monday afternoon, four long morning sessions to complete its program. This would carry the meetings of the Engineering Association over until Friday noon. The Transportation & Traffic Association might require an equal number of meetings. The Claim Agents' and Accountants' associations, however, if they should take the same time as last year, could easily dispose of their business by Thursday noon.

It would probably be advisable for the American Association to continue to hold all of its sessions in the afternoon, so as to permit the executive officers to attend any of the morning sessions of the affiliated associations in which they were especially interested. We see no good reason, however, why the Claim Agents', Accountants', Transportation & Traffic, and Engineering associations should not hold their meetings simultaneously. Last year all four of these associations held meetings on Tuesday morning, and two and sometimes three of the associations held simultaneous meetings on other days of the week.

One reason for prolonging the meetings of the Engineering Association until Friday afternoon has been the desire to give the members of that association one whole day in which to inspect the exhibits. It is a fact, however, that the intermission of one day between the meeting on Wednesday afternoon and Friday morning has resulted for a number of years in many members leaving on Wednesday evening, so that they not only missed inspecting the exhibits on Thursday, but were also absent from the two sessions on Friday. If the meetings of the Engineering Association were held on consecutive days in the morning, the members would have four afternoons free for the exhibits, and would really have more time to spend in visiting the booths and in examining the new apparatus than they have at present.

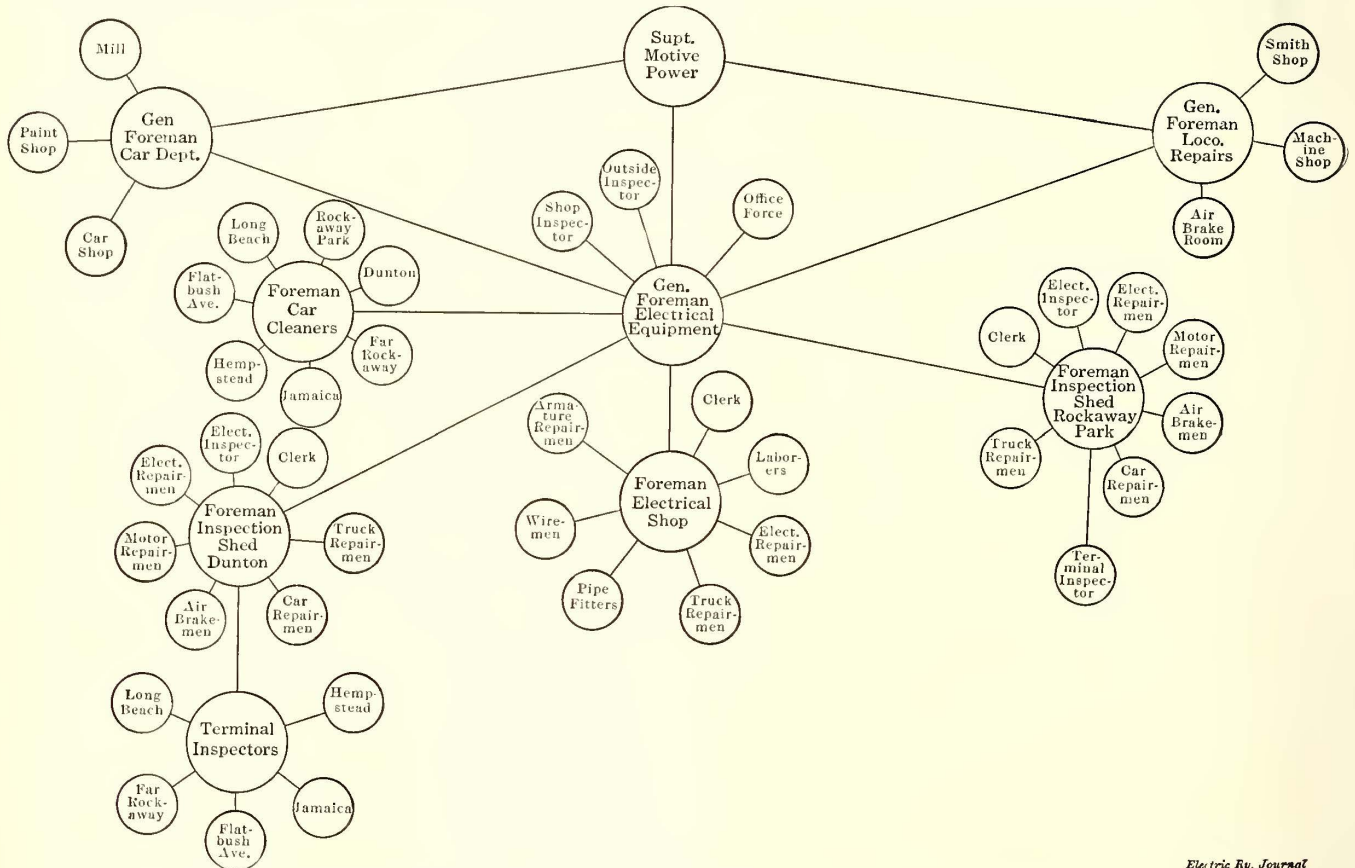
The plan outlined is that which is followed at the conventions of the Master Car Builders' and the Master Mechanics' associations. Each of these associations holds only three sessions, beginning promptly at 9:30 in the morning and lasting until 1:30 or 2 p. m. Their programs are long and the discussion seldom lags, yet they usually succeed in dispatching the business which comes before them and have some time to spare. In a convention town like Atlantic City, where the delegates are widely scattered at different hotels, some of them a long distance from the meeting place, it is almost impossible to begin an afternoon session before 2:30 or even 3 o'clock, even when there is no morning session, and when a morning session continues until 1 o'clock, the time at which the afternoon session begins is apt to be still later. The days are short in October and by 5 o'clock the daylight is gone. We hope that this plan will be considered by the executive committees of the different associations in making up their programs for the 1911 convention.

### CAR EQUIPMENT INSPECTION AND MAINTENANCE ON THE LONG ISLAND RAILROAD

Regular operation of electric trains on the Long Island Railroad between Flatbush Avenue, Brooklyn, and Rockaway Park was begun on July 26, 1905, and before the end of that year was extended to Rockaway Junction, Valley Stream and Far Rockaway. Electric trains are now being operated also to Hempstead, Long Beach and the Pennsylvania Station in New York City. The electrified lines include about 62 route miles and 164 miles of single track. The original electric car equipment has been in service for nearly six years and the work of maintaining it in good condition has reached the stage of uniform routine based on experience covering all conditions of weather and traffic demands. The methods of inspection and shop overhauling used are representative of the requirements of an electrified steam railroad operating heavy high-speed local and express suburban service with direct-current, multiple-

Fifty additional steel motor passenger cars with 54-ft. bodies are now being built.

The 134 steel motor passenger cars with 41-ft. bodies constitute the original motor car equipment. They were built in 1905 from designs of George Gibbs, chief engineer of electric traction of the Long Island Railroad, and resemble very closely the steel cars designed by him and built about the same time for the Interborough Rapid Transit Company's subway service. A complete description of these cars was printed in the STREET RAILWAY JOURNAL of Aug. 11 and 18, 1906. The bodies are of steel, 41 ft. 1/2 in. long over corner posts with four cross seats in the center on each side. They are mounted on a motor truck and a trailer truck, both of the equalized, pedestal type made by the Baldwin Locomotive Works. The electrical equipment consists of two Westinghouse No. 113 split-frame motors of 200 hp each, with Westinghouse electro-pneumatic unit-switch control, using storage batteries for the control circuits. The five wooden baggage cars have the same trucks, motors and control apparatus as the steel passenger cars. The



Long Island Railroad—Diagram of Electric Car Equipment Inspection and Maintenance Organization

*Electric Ry. Journal*

unit trains. Since electric operation was begun there have been no long interruptions to service owing to failures of the car equipment, nor have there been any serious accidents resulting from derailments or collisions of electric trains. Some changes have been made in the details of the electrical apparatus on the original cars and in the new cars now being equipped and put in service, but on the whole the motors, control equipment and brakes installed on the cars six years ago have given excellent results and are still in good condition.

**EQUIPMENT**

The electric car equipment of the Long Island Railroad includes the following:

- 134 steel motor passenger cars, 41-ft. bodies.
- 5 wooden motor baggage cars.
- 80 wooden trailer cars.
- 150 steel motor passenger cars, 54-ft. bodies.
- 15 steel combination passenger and baggage motor cars.
- 7 steel motor baggage cars.
- 1 motor rotary snow plow.
- 2 calcium chloride cars to remove sleet from third-rail.

trailer cars were formerly used in suburban steam service and were wired with control and bus line cables, lights and heaters.

The 150 steel passenger cars and the 15 combination cars are of the standard design of the Pennsylvania Railroad, slightly modified to permit the installation of electric equipment. They will be fully described in a later issue. The bodies are 54 ft. long over corner posts and are mounted on a motor and a trailer truck. The trailer truck, which is the Pennsylvania Railroad standard four-wheel design, was illustrated in the ELECTRIC RAILWAY JOURNAL for June 29, 1908. The motor truck is of the same general type and on it are mounted two Westinghouse No. 308 interpole, box-frame motors of 215 hp each. The control apparatus and air-brake equipment is the same as on the earlier steel motor cars with some slight changes. The seven steel baggage cars are equipped with two No. 308 motors on each truck and duplicate control apparatus, making them practically two single-car equipments in one. The first of the new steel cars was put in service early in 1910, but the routine inspection and maintenance work is the same on them as on the old cars. In addition to caring for this equipment the elec-

trical repair shops at Morris Park do all the electrical overhauling and truck work for about 50 surface cars operated on the trolley lines owned by the Long Island Railroad at Huntington, Northport, Sea Cliff, Glen Cove and Rockaway Beach.

SHOP AND INSPECTION FACILITIES

At the time electric operation was begun reinforced concrete inspection sheds were erected at Dunton and Rockaway Park, and an addition to the car and locomotive shops at Morris Park was built to handle repairs to electric cars. The structural features of the shops and inspection sheds were fully described in the STREET RAILWAY JOURNAL for Aug. 18, 1906. The Dunton inspection shed is 242 ft. 8 in. long and 94 ft. wide. It contains six pit tracks, each long enough to hold a train of four cars of the older types or three cars of the 1910 type. The shed at Rockaway Park is of the same length, but contains only three tracks. The third-rail is not continued into the sheds, but the cars are moved inside of the buildings by connecting to one contact shoe a jumper cable dropped from a carriage running on a T-iron track above the aisle between pits.

The electrical shop at Morris Park consists of a one-story brick and steel frame building 216 ft. long and 110 ft. wide, parallel to and separated from the car and paint shop building by a transfer table pit. The two buildings are connected at one end by a two-story mill, part of the ground floor of which is used for the armature and electrical repair shop and for wheel turning. The electrical shop contains 13 pit tracks each holding one car with ample space at each end next to the walls. Two tracks next to the mill building are spanned by two 10-ton Niles electric traveling cranes and are used for truck repairs.

ORGANIZATION OF ELECTRICAL EQUIPMENT DEPARTMENT

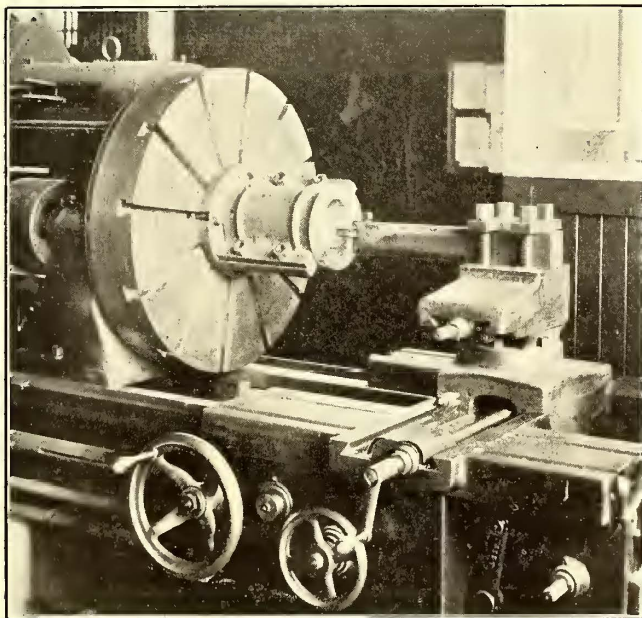
The force of men in charge of maintenance and repair of electrical equipment is headed by G. C. Bishop, superintendent of motive power, who also has supervision over all steam locomotive and car equipment belonging to the Long Island Railroad. Reporting to him are a general foreman of electrical equipment, R. W. Brodmann, who has supervision over all electrical repairs and inspection; a general foreman of the

INSPECTION METHODS

The inspection given to all electric cars includes terminal train inspection whenever a car is put on or cut off of a train, regular inspection at one of the two inspection sheds at the completion of 1000 miles, general inspection and oiling at the completion of about 6000 miles and general overhauling at the completion of 60,000 miles. When electric operation was begun the inspection methods of the Interborough Rapid Transit Company as used in the subway service were adopted, but it soon became evident

LONG ISLAND RAILROAD CO.		Form M.P. 16	13x7 1/2
Motorman's Report of Defects in <span style="float:right">Motor Trailer Trolley Baggage</span> Car No.		L. I. R. CO. M. P. Dept.	
Date .....	190 Division .....	Car .....	Date .....
Time .....	M.	Arm. Bearings Oiled	
Train No. ....	Place of Trouble .....	Air Compressor Oiled	
Length of Detention .....	Hrs. .... Mins. ....	Motors Cleaned	
Place Laid Up .....	.....	Brakes Adjusted	
Motorman .....	Conductor .....	Control Inspected	
<b>Air Brake Troubles.</b>		Lights & Heaters Insp.	
Motorman's Valve .....		Car Bodies Inspected	
Brakes do not stop train .....		Contact Shoes & Beams	
Governor .....		Auto Couplers & Hoses	
Compressor not working .....		Brake & Feed Valves	
Compressor fuse blown .....		Blower Motors Insp.	
Air Whistles .....			
Slide Valve Feed Valve .....			
Triple Valve .....			
<b>Car Body Troubles.</b>			
Door .....			
Glass broken .....			
Ventilators .....			
Bell .....			
Platform Trap Doors .....			
Pantagraph Gate .....			
Chains .....			
Draw Bar .....			
King Pin Cover .....			
Car Seats .....			
Car Floor dirty .....			
<b>Truck Troubles.</b>			
Register .....			
Sand Boxes .....			
Fenders .....			
Grab Handles .....			
Hand Brakes .....			
Gang .....			
Snow Scraper .....			
<b>Controller and Motor Troubles.</b>			
Controllers .....			
Trolley Pole .....			
Circuit Breaker .....			
Auto Transformer .....			
Motors .....			
<b>Miscellaneous.</b>			
Dead Car .....			
Was Power Reversed? .....			
Were motors bucked? .....			
Was emergency brake used? .....			
Obstruction on track .....			
REMARKS			

Long Island Railroad—Motorman's Report of Defects and Record of Inspection



Long Island Railroad—Method of Boring Motor Bearings

car department who has charge of all freight and passenger car body repairs and painting, and a general foreman of locomotive repairs who is in charge of the machine and smith shops at Morris Park and also the air-brake department. Heavy repairs to electric car bodies and trucks are made by the car and locomotive departments on shop orders signed by the general foreman of electrical equipment. The complete organization of the electrical department is shown in the diagram on the opposite page.

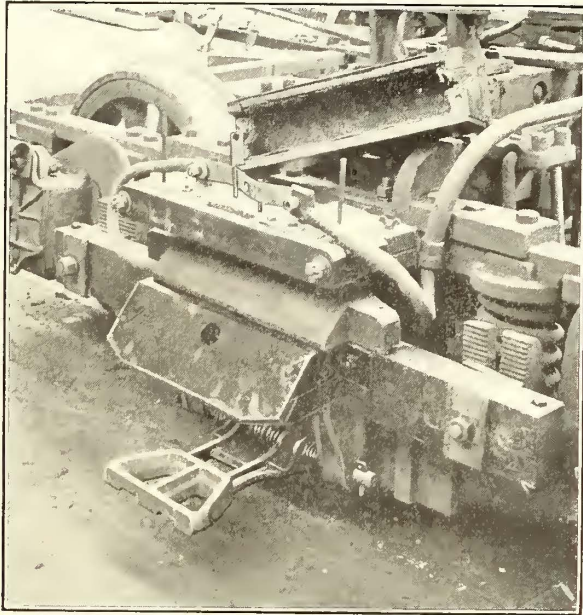
that a regular three-day inspection period was unsuited to the conditions on the Long Island Railroad. Unlike the subway service, where the cars were kept together in trains, cars were put on and cut off of trains on nearly every trip and it was impossible to keep together cars due for inspection on the same day. A mileage basis was adopted later and the period between inspections was fixed at 800 miles. After a thorough trial the period was lengthened to 1000 miles.

The foreman of the inspection shed at Dunton receives each day duplicate copies of all conductor's car-mileage reports to the car record office at Jamaica. A clerk sorts these by car numbers and the mileage of each car is entered on a separate card. The clerk goes over these cards every day and makes up a list of the numbers of all cars which will have made 1000 miles by the following day. A copy of this list is sent to the trainmaster, and all cars due for inspection are cut out of trains at the Jamaica terminal yard as they come in during the day. They are made up into trains, and a special drill crew runs these trains to the Dunton inspection shed and brings back trains which have passed inspection. The Rockaway Park shed adjoins the terminal at that part and no drill crew is required there. As fast as the cars are inspected and found in good condition they are returned to service. All inspection at the sheds is done during the daytime.

TERMINAL INSPECTION

Terminal inspectors are stationed at Rockaway Park, Hempstead, Far Rockaway, Jamaica, Flatbush Avenue and Long Beach

for the purpose of inspecting the brakes and control on all trains after cars have been put on or cut off and for detecting hot journals, worn brakeshoes and other visible defects. At the end of a run the motorman makes out a repair report card if he or the conductor has noted any defects in the train and this card is turned in to the terminal inspector. If the inspector cannot remedy the defect or trouble reported or he discovers any other defects which he cannot remedy the car is cut out and sent to the inspection shed with a statement of the reason for



Long Island Railroad—Third-Rail Shoe Fuse

taking the car out of service. For convenience the principal defects found on a car are noted on a tag which is attached to the car when it is sent to the inspection shed. The terminal inspectors make a daily report to the general foreman of electrical equipment by car numbers of all defects noted and repaired and copies of these reports are sent to the inspection shed foremen so that attention may be given to any defects to remedy which temporary repairs were made.

#### REGULAR INSPECTION

Cars brought in for the 1000-mile inspection are made up in trains of three or four cars. The following is an outline of the work done on each car:

**Trucks:** Third-rail shoe fuses, shoe fuse boxes, shoe beams and contact shoes inspected; broken and blown fuses replaced and contact shoes gaged. Journal brasses inspected for loose or broken babbitt. Worn brakeshoes replaced and brake rigging adjusted; side bearings and center plates oiled; all truck bolts inspected and tightened; brake rigging and bolster chafing plates oiled. Wheels gaged, tires and flanges inspected.

**Motors:** Motors cleaned and blown out with compressed air; brushes removed, brush holders, commutators, armature clearance and motor leads inspected; brushes cleaned and returned; brush holder shunts, hammers and springs examined.

**Oiling:** Armature bearings oiled. Oil wells are first gaged, then replenished with oil to a depth of  $3\frac{1}{2}$  in. on commutator end and 4 in. on pinion end. Axle bearings gaged and replenished with free oil to a depth of  $2\frac{1}{2}$  in. If axle bearings are worn to exceed  $1/16$  in. they are replaced.

**Car Bodies:** All bolts inspected and tightened; drawbars, pilots, trapdoors, windows, seats, sliding doors, end doors, safety tread, flooring, bells, bell cords, gates, chains, sliding door devices, roofs, ventilators, etc., inspected.

**Air Brake:** Compressor motor blown out, cleaned and inspected; armature clearance gaged; brushes removed, brush holders examined and tension readjusted if necessary, brushes cleaned and replaced; commutator cleaned if necessary; compressor bearings and crank chamber oiled; air strainer inspected

and cleaned; piston travel and slack adjuster examined and set; main reservoirs drained; control reservoirs drained; conductor's valve, motorman's brake valve, feed and reducing valves tested; whistle tested; air hose and automatic couplers inspected; hand brakes inspected and tested.

**Switch Group:** Blown out and cleaned; all worn parts replaced; interlock fingers examined for tension and contact; switch group operated for sluggish switches or leaking valves.

**Line Switch:** Same as switch group.

**Reverser:** Same as switch group.

**Switchboard:** Blown out with compressed air and all switches and other apparatus examined and wiped off; heater circuits tested; light circuits tested; master switches examined and tested.

After all work on the cars is completed each car is operated from both ends in the forward and reverse directions, with the line switch out. The train is then made up and operated from both ends, and the action of the switch groups and reversers is noted. The circuit-breakers are tripped and reset; the automatic emergency train brake tried and the air brakes tested; storage batteries are tested for charge.

An inspection crew consists of one electric repairman and one helper who inspect and repair all electrical apparatus; one motor repairman and one helper who inspect motors and oil bearings; one air brake repairman who inspects the air brake apparatus; one carpenter who attends to the necessary body repairs, and one electrical inspector who gives the trains a final inspection and tests both the air brakes and electrical equipment before the train leaves the inspection shed. If more than one train must be inspected at a time an extra crew of the same size is put on each train. The time required for a regular inspection of a four-car train is  $1\frac{1}{2}$  hours.

A record of each inspection of each car is kept on small cards  $1\frac{7}{8}$  in. x  $7\frac{3}{4}$  in., one of which is placed in a tin holder and hung on the car when it is brought into the inspection shed. This card has 11 blank spaces for entering the signatures of the men who inspect each of the different parts on the car. On the back of the card the mileage of the car since the last previous inspection is entered and the card is then filed by the car number for convenient reference. The inspection shed foreman sends to the general foreman of electrical equipment each day a full report of all defects discovered while going over cars for inspection and also a report of incandescent lamps renewed. If a car needs to be sent to the shop a statement of all the defects found is sent with the car for the information of the shop foreman.

Owing to the short time available for making an inspection, repair work at the inspection sheds is confined to renewals of worn or defective parts. A small stock of brakeshoes and contact shoes, fuses, brushes, lamps, etc., is kept at each inspection shed and one or two extra brake valves, feed valves, triple valves, compressors, blower motors, storage batteries and other unit parts are also kept on hand to replace any defective parts found. All parts removed from the cars are returned to the shops at Morris Park for repairs.

#### GENERAL INSPECTION

At every sixth inspection, or 6000 miles, each car is given a thorough inspection and oiling which includes everything done at the regular inspection with the following additional work:

Packing is removed from all journal and bearing boxes; waste is teased and the boxes are repacked with the same waste if in good condition; free oil in the armature and axle boxes is brought up to proper level; journals are supplied with two gills of additional oil; gears and pinions are examined and supplied with 10 lb. of gear grease per motor; car wiring is examined and tested; junction boxes, switch group, reverser, line switch and other apparatus are examined as to general condition of wiring and wire terminals and connection blocks. Switch groups, line switch, reverser and rheostat frames and batteries are tested for grounds; all insulated bolts, washers and pipe insulators are cleaned and shellacked; plug is removed from switch group air chamber

and air chamber is blown out; all power connections in the switch group and line switch are examined and tightened; the pistons of the air cylinders in the switch group are oiled, pin valves on all electro-pneumatic switches are removed and cleaned; brake valves, feed valves, compressor governors, check valves and other air brake apparatus cleaned, oiled and adjusted. Brake cylinders are cleaned and lubricated every six months. A general inspection of this kind requires three hours for a four-car train.

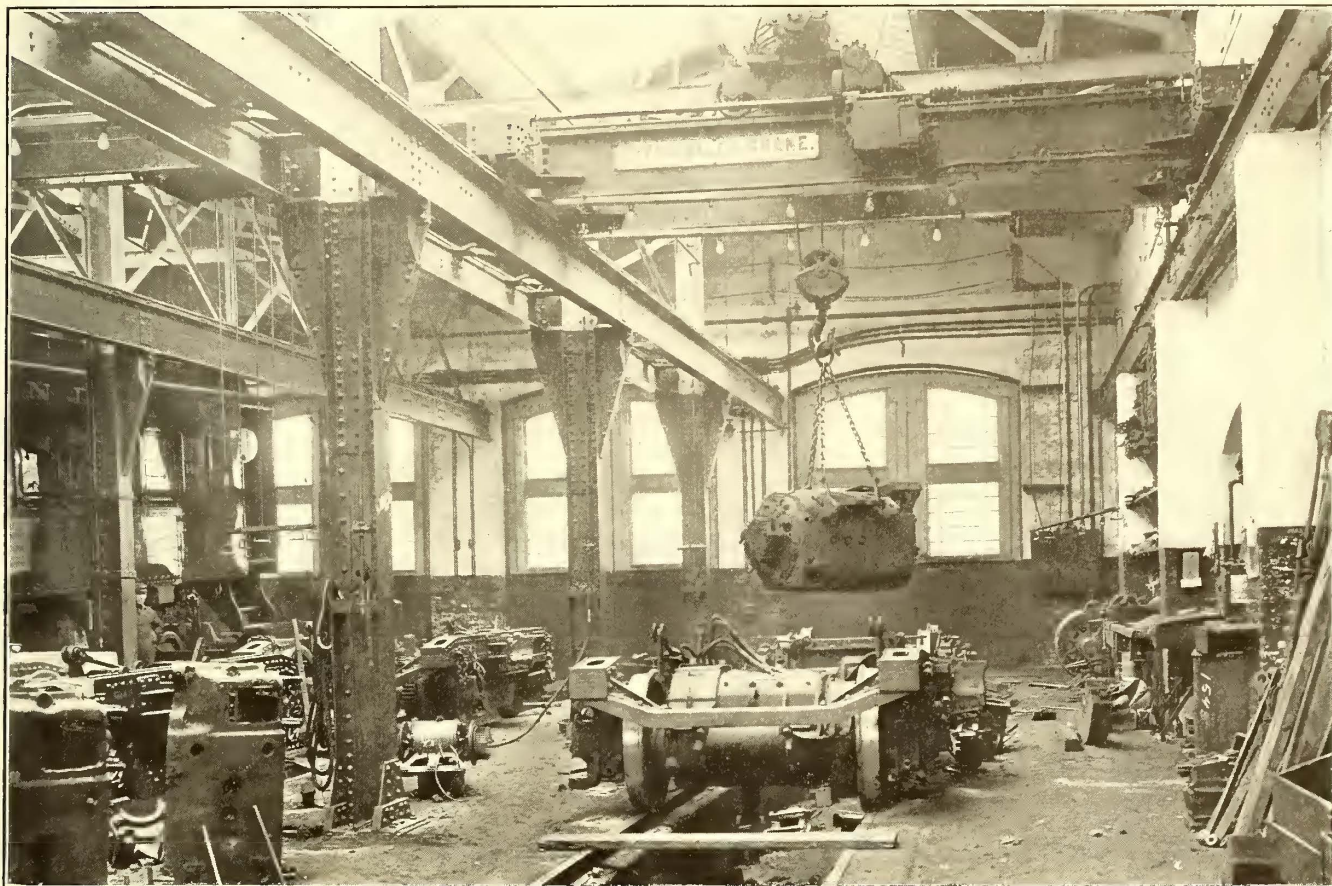
#### SHOP OVERHAULING

When a car has completed 60,000 miles it is sent to the shop at Morris Park for a general overhauling. The body is jacked up off of the trucks and supported on wooden horses and is stripped of all removable parts. The brake valves, triple valve, governor and air compressor are sent to the air-brake room for cleaning. The brake cylinder is cleaned and oiled and the reservoirs are drained. All piping is carefully inspected for leaks and corrosion. The line switch is removed and taken

axle and armature-bearing shells on all motors are rebabbitted with a tin-base metal composed of 80 per cent tin, 10 per cent lead and 10 per cent antimony. The interior and exterior of the motor are given a coat of asphaltum paint. Brush holders are removed and overhauled; all brass parts are dipped in an acid bath and new shunts and springs applied.

#### ARMATURE WINDING

The armatures of the motors used on the Long Island Railroad are wound with strap copper, each coil consisting of three ribbons. The two halves of each coil when new were riveted together at the pinion end after being put in place in the slots. In rewinding the armatures several departures from ordinary practice have been made. The old coils are stripped and are then built up with strips of thin micanite coated on both sides with white shellac to prevent flaking. The micanite is placed between the copper straps and the coil is then wrapped with one layer of thin linen tape to hold it together. The straight part of the coil is surrounded with a box of sheet



Long Island Railroad—Truck Repair Bay

apart for inspection and cleaning and all switches on the switchboard are cleaned and polished. The switch group and reverser are not taken down but the pistons are removed and the cylinders cleaned and oiled, contacts polished and interlocks inspected. All junction boxes are opened, connections examined and binding-post nuts tightened. The control storage batteries are tested and replaced by others if they are deteriorated. Heaters are inspected and their capacity tested with an ammeter. The lighting circuits are also tested and the sockets examined for loose connections. Unless a car requires heavy body repairs it is not moved from the electrical shop and all painting and varnishing is done while the equipment is being overhauled.

#### MOTOR REPAIRS

After the trucks have been removed the motors are opened and inspected for baked fields and armatures. A motor which shows any signs of defective insulation is taken off and if in the judgment of the foreman of the electrical shop the fields or armature need rewinding the necessary work is done. The

micanite and thin fish paper and the whole coil is taped with asbestos tape 1 in. wide, after which it is dipped in an insulating compound and allowed to dry. The asbestos tape is kept in rolls in a steam drying oven and is exposed to moisture, only while the coil is being wrapped and before it is dipped. After the top and bottom layers are in place small clips of tinned copper are slipped over the ends of the two halves of each coil and soldered on. A canvas hood is then applied over the soldered joints. A Passburg vacuum impregnating plant has been installed recently and all armature and field coils will be impregnated with this process in the future. Two old lathes are used for banding. One is belted for slow speed and the other for high speed. An apprentice learns on the slow-speed lathe and then is advanced to the high-speed lathe as he becomes more proficient. A piece of German silver set in the slot of the tool post is used to give the desired tension on the banding wire.

#### COMMUTATORS

Commutators are turned in a large Pond lathe used for

boring bearings and other machine work. A fine feed with a sharp-pointed diamond-shaped tool set well above the center is used. This gives an excellent surface to the commutator. When electric operation was first begun several commutators were slotted to a depth of about  $\frac{3}{32}$  in., but unsatisfactory results were secured due to short-circuiting between the bars and the practice was discontinued. Recently, however, a few commutators have been slotted to a depth of  $\frac{1}{32}$  in. and it has been decided to slot all commutators in the future. For patching burns on commutators a cement made of dextrine, plaster of paris and shellac is used.

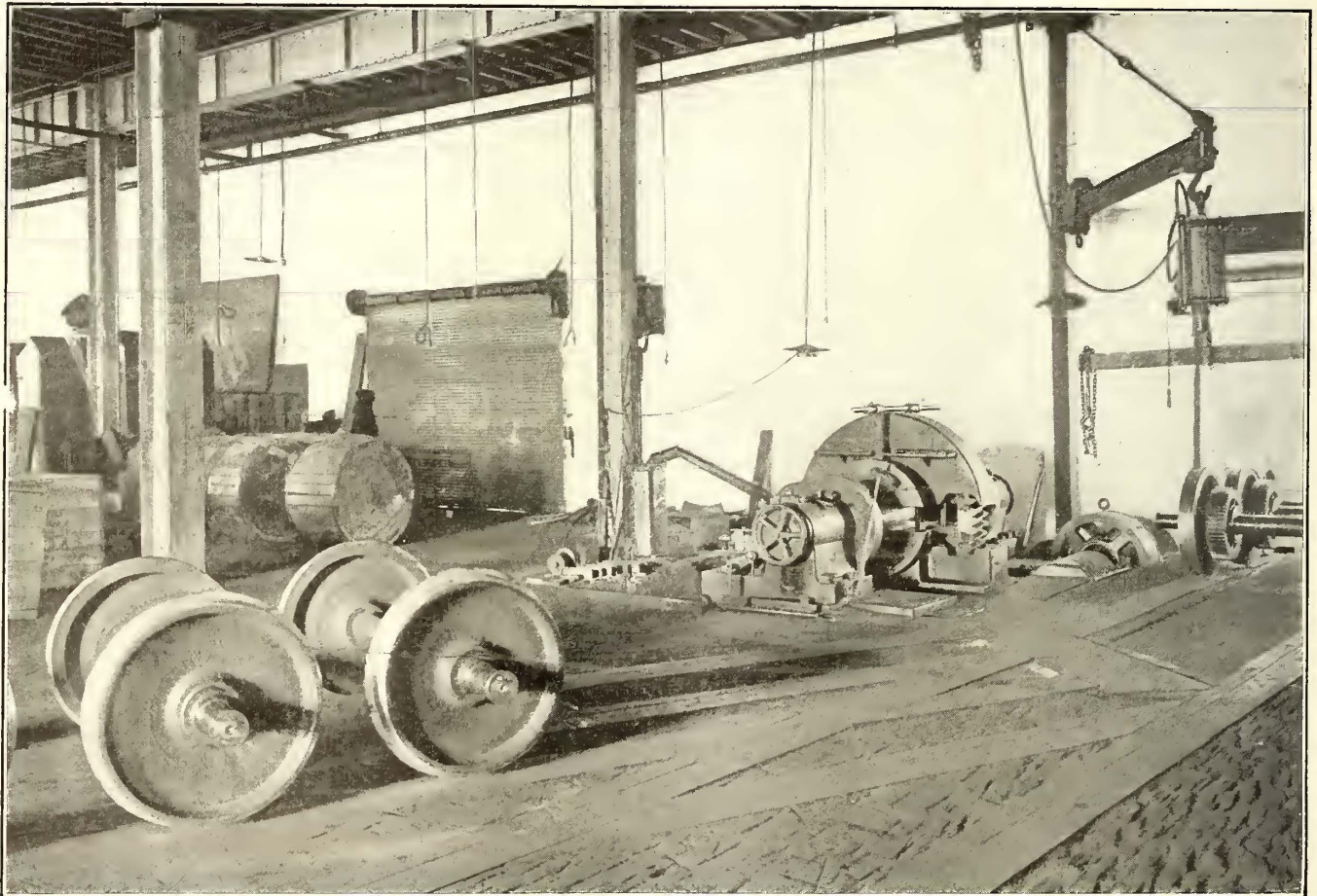
#### BRUSHES

While no serious brush troubles have developed a thorough test was made about two years ago to determine the cheapest grade of brush which would give satisfactory results. The brushes now used are a medium hard grade of the Laclede brand

down as required and there has been no unusual or irregular flange wear. Steel-tired wheels are used under the old cars but several hundred solid steel wheels have been applied under the new cars. A Niles center-drive wheel lathe is used to turn all electric car wheels and some steam passenger car wheels. It is located in a pit on the ground floor of the mill building adjoining the truck overhauling tracks in the electrical shop. The floor of the shop is of smooth asphalt in which have been embedded flat steel plates about 12 in. wide to form runways on which a pair of wheels and axle can be rolled from the electrical shop into the adjoining room and on to the bed of the wheel lathe. A jib crane with an air hoist is used to serve the wheel lathe. All wheels are pressed on and off in the machine shop.

#### TESTING CARS

After a car has been overhauled and all parts reassembled



Long Island Railroad—Wheel Lathe and Steel Plates in Shop Floor

made by the National Carbon Company. The life of the brushes is from 45,000 to 50,000 miles. All brushes are of the same width and hardness and are held on the commutator with a pressure of about 6 lb. per square inch. No difficulty from worn commutators, excessive sparking or carbon dust is now being experienced.

#### BEARINGS

Motor armature and axle bearings of all sizes are turned in a chuck on the Pond lathe. Various sizes of bushings are used to hold the bearings in the chuck and these bushings serve as templates for worn or twisted shells. Only a few of the original armature shafts have required turning and the reduction in diameter has been by even sixteenths of an inch. The bearings for armature shafts of reduced size are bored out to the proper size as required and no stock of odd sizes is kept on hand.

#### WHEELS

No special records are kept of wheels. They are turned

the wiring and equipment is given a thorough electrical test. On the old steel cars all main motor circuit and bus wiring is given an insulation test of 2000 volts a.c. by means of a transformer set mounted on a two-wheel truck. A test of 3000 volts a.c. is given to the same wiring on the new steel cars. Light, heat and control circuits are also given voltage tests of 1000 volts and 1500 volts respectively on the old and new cars. The car is then operated forward and back from both ends with the master controller and the action of all the contactors is noted by notching up with the line switch out and in. In order to test the control train-line connections from both ends a master controller mounted on a panel with a jumper and plug is used. The plug is inserted in each of the two jumper sockets on each end of the car and the master controller operated with the line switch out and in. The final tests are those given to the line-switch circuit-breaker and the limit switch. A water rheostat is used for these tests. It consists of a rectangular wooden tank outside of the building in which



are placed two large iron plates. One plate is stationary and the other is hung from a cross-bar mounted on wheels running along the top of the tank. A long wooden handle is attached to the center of the cross-bar and projects through a window into the shop. By pushing the handle in or out the movable plate is moved toward or away from the fixed plate. To test the limit switch the car is blocked and a bell is inserted in the control circuit of the limit switch. One man on the car notches up the controller one notch while another man manipulates the water rheostat and watches the ammeter mounted on the wall near the window. When the limit switch opens owing to the flow of an excess of current the bell stops ringing and the man on the car blows the whistle. The ammeter reading is then taken and the limit switch is adjusted until it opens at 350 amp. The capacity of the line switch is tested in the same way. The car is blocked and the controller notched up to the full series position. The water rheostat is then closed up until the safe current value is reached or the circuit-breaker opens. The circuit-breakers on the old steel cars are set for 750 amp and on the new cars for 850 amp.

#### FUSES

Among the minor electrical troubles which have developed and have been overcome may be mentioned breakages of contact shoe fuses. When the cars were first put in service the contact shoe fuse boxes were mounted on top of the shoe beam. Cartridge type fuses were used, but because of the absence of spring support the excessive vibration caused the fuse links to break and the arcing between the broken ends set the paper shells on fire. Copper ribbon fuses set vertically on edge were next tried, but these also broke at the punched hole in the center. The experiment was made of removing the fuse box from the shoe beam and bolting it to the truck side frame so as to introduce some spring resilience and this remedied part of the trouble. At the suggestion of one of the inspection foremen two wooden pins staggered on each side of the fuse were set in the base and the copper ribbon was woven in between these pegs so as to give it support and a slight tension. This simple remedy has greatly reduced the number of broken shoe fuses. The attachment of the fuse box covers also proved a puzzling problem. They are now fastened on with two long bolts passing through the base and the top of the cover, on which thumbscrews are turned down. Even if the thumbscrews work loose and drop off the cover cannot shake off of the long stud bolts. On all the new steel cars ribbon fuses supported in standard boxes with clamping wedges are mounted on the truck side frame. Ribbon fuses are punched in a special cutting die which was made in the company's shop. This cutter works on the principle of a perforating punch for filing papers. Both ends are cut and the hole punched in the center at one operation. It has been found that fewer breakages occur with hard drawn copper ribbon fuses than with fuses made from annealed copper. Two 750-amp fuses are used on each contact shoe in summer and three 750-amp fuses in winter.

#### SNOW COVERS

The No. 113 motors used on the 41-ft. steel cars have large ventilating openings in the frame which are covered with perforated plates. During snowstorms it is necessary to close these openings in order to keep out snow which is picked up by the air currents under the cars. At the beginning of the winter season the bottom openings on all motors are closed with sheets of tin plate inserted under the ventilated cover plates, but the openings in the top are not covered in order to permit of some ventilation. At the first indication of a snowstorm the terminal inspectors begin to apply snow covers to the top openings on all cars as fast as they arrive at the terminals. These covers are sheets of tin plate cut to fit the ventilating openings. The perforated covers are loosened and the plates are slipped underneath, after which the cover clamps are fastened down tight. An inspector can carry eight or ten snow covers over one arm and all the motors in a train can be fitted in a few minutes. The snow covers are allowed to re-

main on the motors until the snow between the rails has packed down hard, when they are removed at the terminals and stored away for use when again needed. The No. 308 motors on the new cars have sheet-iron guards over the ventilating openings, and as they are ventilated from the interior by forced draft supplied by a blower snow is not likely to sift into the frame.

#### STORAGE BATTERIES

The control circuits on the cars are energized from storage batteries carried in a cradle under the body. Two batteries of seven cells each are placed on each car. They are connected in multiple with a resistance unit which is in series with the compressor motor, so that they are charged when the compressor motor is running. Two double-throw switches are installed on the switchboard in the motorman's vestibule and the two batteries are oppositely connected to these switches. When both switches are up one battery is connected for charging and the other for discharging through the control circuits. When both switches are down the functions of the two batteries are reversed. It is the duty of the terminal inspectors to throw the battery switches every morning. On even-numbered days of the month the switches on all cars are thrown up and on odd-numbered days they are thrown down. In this way the batteries are reversed every twenty-four hours. The batteries are inspected and tested for charge at each 1000-mile inspection and very few road failures have been experienced.

#### TRUCK BRAKE RIGGING

The Baldwin motor trucks under the old cars are all fitted with spiral brake release springs attached to the tops of the line levers and compressed when the brakes are applied. Considerable trouble has been experienced due to the live lever brake rods dragging on the wheels and wearing through. To overcome this the brake release springs are being turned around and attached to the side frame on the opposite side of the transoms.

The first brakeshoes used were made of soft gray iron with crucible steel inserts in the face. These caused some trouble by scoring the tread of the wheel. The company is now using a soft-iron reinforced back shoe with chilled ends. The life of these shoes is less, but the cutting of the wheel treads has been overcome.

#### WINTER STORAGE FOR CARS

The winter schedules do not require as many cars as in the summer and the surplus equipment is stored under cover in a shed at Springfield. This shed contains three tracks, each holding a ten-car train, and it is in charge of a watchman. On Sunday of each week an inspector goes to the storage shed and connects the bus line on each train to the third-rail outside of the building. This starts the compressors and charges the control storage batteries. After the air-brake system is charged with air the brakes are applied and released a few times and the control is notched up and off with the line switches out so as to move all the parts and keep them lubricated. The brake and control reservoirs are then bled off to prevent condensed moisture from freezing in them.

The cars in storage are kept in complete operating condition and no parts of the equipment are allowed to be removed. When extra cars are needed for any reason they are withdrawn from the storage shed and during the winter months as cars are overhauled in the shop they are sent to the storage shed instead of being returned immediately to service. Thus as the summer season comes on the equipment which is withdrawn from storage is freshly painted and in perfect operating condition. Before being placed in service cars which are withdrawn from storage are given the regular 1000-mile inspection.

#### COST OF INSPECTION AND MAINTENANCE

The average cost of terminal and shed inspection of the electric car equipment for the two years ended Dec. 31, 1910, was 20 cents per 100 car miles. This did not include car cleaning, which cost 25 cents per 100 car miles. The cost of maintaining the bodies and electrical equipment of the motor cars for the same period was \$2 per 100 car miles and for the wooden trailer cars, 75 cents per 100 car miles.



## NEW 82-TON ELECTRIC LOCOMOTIVE OF THE NORTHERN ELECTRIC RAILWAY

BY J. PAULDING EDWARDS, ELECTRICAL AND MECHANICAL ENGINEER OF THE COMPANY

An electric locomotive designed by the writer has recently been placed in service on the lines of the Northern Electric Railway, a California corporation owning and operating 150 miles of third-rail electric railway in the Sacramento Valley. The locomotive with but a few minor exceptions is constructed entirely of steel, and was built and equipped at the company's shops at Chico, Cal.

The accompanying engravings illustrate the principal features of the construction of this locomotive.

### GENERAL SPECIFICATIONS.

#### BODY.

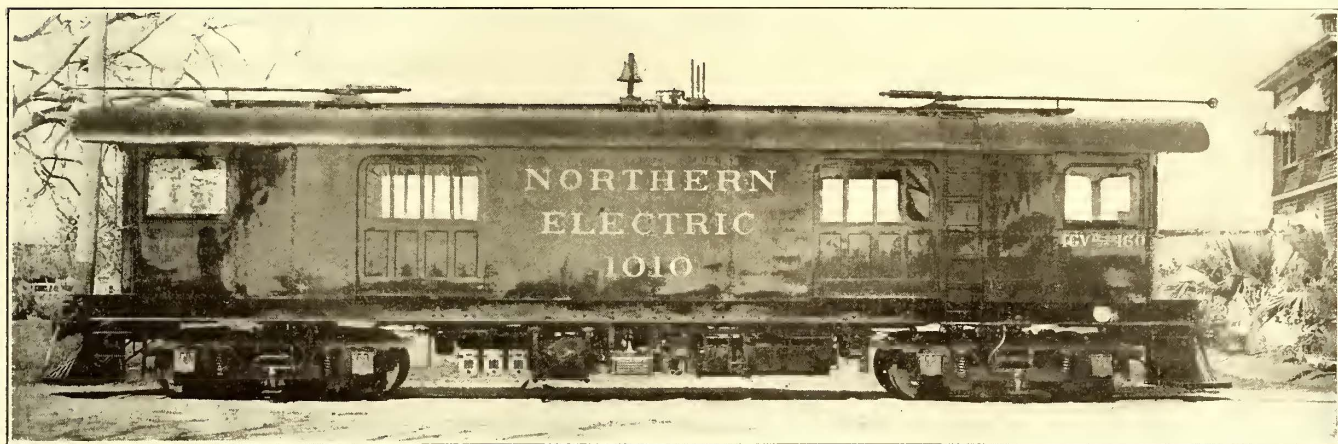
Class, steel express locomotive.  
 Built by Northern Electric Railway, Chico shops.  
 Date completed, April 1, 1911.  
 Capacity (load), 55,000 lb.  
 Total weight loaded, 164,600 lb.  
 Length over all, 53 ft. 2 in.  
 Length inside of body, 45 ft. 2 in.  
 Bolster centers, 32 ft. 0 in.  
 Width over all, 9 ft. 9 in.  
 Width inside sheathing, 8 ft. 11 $\frac{5}{8}$  in.  
 Height, rail to top of roof, 12 ft. 11 $\frac{1}{2}$  in.  
 Height, rail to floor, 4 ft. 7 $\frac{1}{2}$  in.  
 Clear height inside, 7 ft. 3 in.  
 Body bolsters, box type.  
 Pilots, locomotive type with footboards.

12 in. Both are securely riveted to the fillers and longitudinal sills by  $\frac{3}{4}$ -in. rivets. The entire framing is stiffened by diagonal braces on each side of the bolsters, and the ends are braced from the center by 6-in., 12 $\frac{1}{2}$ -lb. I-beams, fastened to the side sills, and by the  $\frac{1}{2}$ -in. x 14-in. plates which form the drawhead bumpers and end-sill contours.

The side framing members, together with the thick steel sheathing, form plate trusses of each side frame; truss rods, therefore, are not required. This construction leaves the under side of the frame free for the attachment of equipment. The side framing consists of 4-in. x 3-in. x  $\frac{1}{2}$ -in. angle posts connected at the top with a 4-in. x 3-in. x  $\frac{1}{2}$ -in. angle plate by means of gussets and angles, and riveted with  $\frac{5}{8}$ -in. rivets. The sheathing is of  $\frac{3}{16}$ -in. steel plate, with butt joints, and is fastened to the side framing with  $\frac{5}{16}$ -in. button-head rivets.

A plain arched roof, consisting of  $\frac{3}{16}$ -in. steel plates supported on 2 $\frac{1}{2}$ -in. x 2 $\frac{1}{2}$ -in. x  $\frac{1}{4}$ -in. angle carlines spaced 2 ft. on centers, forms an arched truss and adds materially to the strength of the body. The plates extend out over the body on the ends and sides, and afford protection from the weather and give a pleasing appearance to the roof. There is a wide wooden running board extending along the top of the roof. It is fastened to the roof by cleats which are bolted to angles riveted to the roof plates.

The first floor is nailed to 4-in. x 4-in. pine girths fastened to the sides of the four sills. This floor is made of  $\frac{7}{8}$ -in. vertical



Northern Electric Locomotive—Side View

#### TRUCKS.

Type, No. 90-50-A Baldwin.  
 Gage of track, 4 ft. 8 $\frac{1}{2}$  in.  
 Wheelbase, 90 in.  
 Weight without motors, 17,060 lb. each.  
 Designed to carry on center plate, 55,000 lb.  
 Bolsters, steel castings.  
 Center transoms, 12-in. 35-lb. channels.  
 Brakes, inside-hung.  
 Wheels, 36-in. rolled steel.  
 Gears, solid type.  
 Axles, 6 $\frac{1}{2}$  in. diameter.  
 Journals, 6 $\frac{1}{2}$  x 11 in.  
 Painted, Pullman standard green.

#### MOTORS.

Type, Westinghouse, No. 301-D interpole; forced air ventilation.  
 Number per locomotive, four.  
 Weight of each, 5650 lb.  
 Gear ratio, 17:60.

#### OTHER EQUIPMENT.

Draft rigging, Miner friction, class A-2-E.  
 Couplers, M.C.B. Climax, 5 x 7-in. shank.  
 Sanders, electro-pneumatic.  
 Whistle, Northern Electric triple trombone.  
 Trolley retrievers, Knutson No. 4.  
 Headlights, G. E. luminous arc with semaphore lens.

#### BODY

The body underframing is constructed of four 12-in., 35 $\frac{1}{2}$ -lb. I-beam side and center sills, running the entire length of the locomotive. The cross members are of the same size material and were accurately cut to fit the contour of the sills. Connecting angles, 6 in. x 4 in. x  $\frac{1}{2}$  in., with  $\frac{3}{4}$ -in. rivets, are used to fasten them in place. The bolsters are built in place and consist of a top and bottom plate. These plates are securely riveted to two 12-in. I-beam fillers. The top bolster plate is 1 in. x 12 in., and the bottom bolster plate 1 $\frac{1}{2}$  in. x

grain tongue and grooved pine, and is laid slightly diagonal of the car, one end being 11 in. ahead of the transverse center line. The top floor is laid crosswise, also, and is securely nailed to the first floor. A double thickness of deadening felt was placed between the two floors. The flooring on the platforms is placed diagonally, and also is entirely separate from the main floor of the locomotive.

All the doors and sashes are made of ash and faced on the outside with No. 16 sheet steel. They are finished inside in natural color. The glass used is  $\frac{3}{16}$ -in. American polished plate. The side windows are arranged to slide, and owing to their weight are hung on overhead tracks with rollers. The end sashes are stationary and secured by bolts to the window frames.

#### TRUCKS

The trucks were built by the Baldwin Locomotive Works, and in size are among the largest trucks ever built for this class of service. They are of the M.C.B. type, with an equalized swinging bolster carried on triple elliptical springs. They are designed to carry 55,000 lb. on center plates, and have a 90-in. wheelbase.

The axles are 7 in. in diameter at the center, with 6 $\frac{1}{2}$ -in. x 11-in. journals, and are fitted with standard 36-in. M.C.B. rolled-steel wheels. The side frames are forged of 2 $\frac{1}{2}$ -in. x 4 $\frac{1}{4}$ -in. steel bars, and are connected to the transom channels by heavy steel castings which also support the brake levers and shoes. The brakes are inside hung and are equalized at the top

of the live levers by a crossbar connecting both sides and working across the top of the inside motors. The bolster is a steel casting with the side bearings and center plate cast integral. Both sides of each truck are equipped with contact shoes for the conductor rail. The shoes, which are of the slipper type operating on a top running rail, are mounted on a beam suspended from brackets cast on the bottoms of the equalizer spring seats.

#### MOTORS

The motor equipment is quadruple. The motors, which were designed particularly for locomotive service, are Westinghouse No. 301-D, interpole, 550-650-volt d.c., series-wound, railway type, and were built to specifications requiring the fulfilment of guarantees as follows:

#### MOTOR PERFORMANCE

"Considering the nominal rating of these motors as the load which gives a rise in temperature of not to exceed 90 deg. C. at the commutator and 75 deg. C. at any other part of the motor after one hour's continuous run on the testing stand with covers removed, but without artificial or forced ventilation (referred to surrounding air at 25 deg. C.), these motors shall not rate less than 160 hp at 550 volts, or 175 hp at 600 volts. The nominal rated capacity for one hour shall be

Forced ventilation for cooling the motors is provided by a 12-in. Sturtevant type blower driven at 1500 r.p.m. by a 3½-hp, series-wound, 550-volt motor. As shown in the interior view of the locomotive, the blast is conveyed through metallic conduits directly to headers immediately above the motors. From these headers it is led through the floor and through canvas tubes to the motor inlets. The efficiency of forced ventilation for the motors of this type of locomotive is well shown by the following tabulated comparison of ratings:

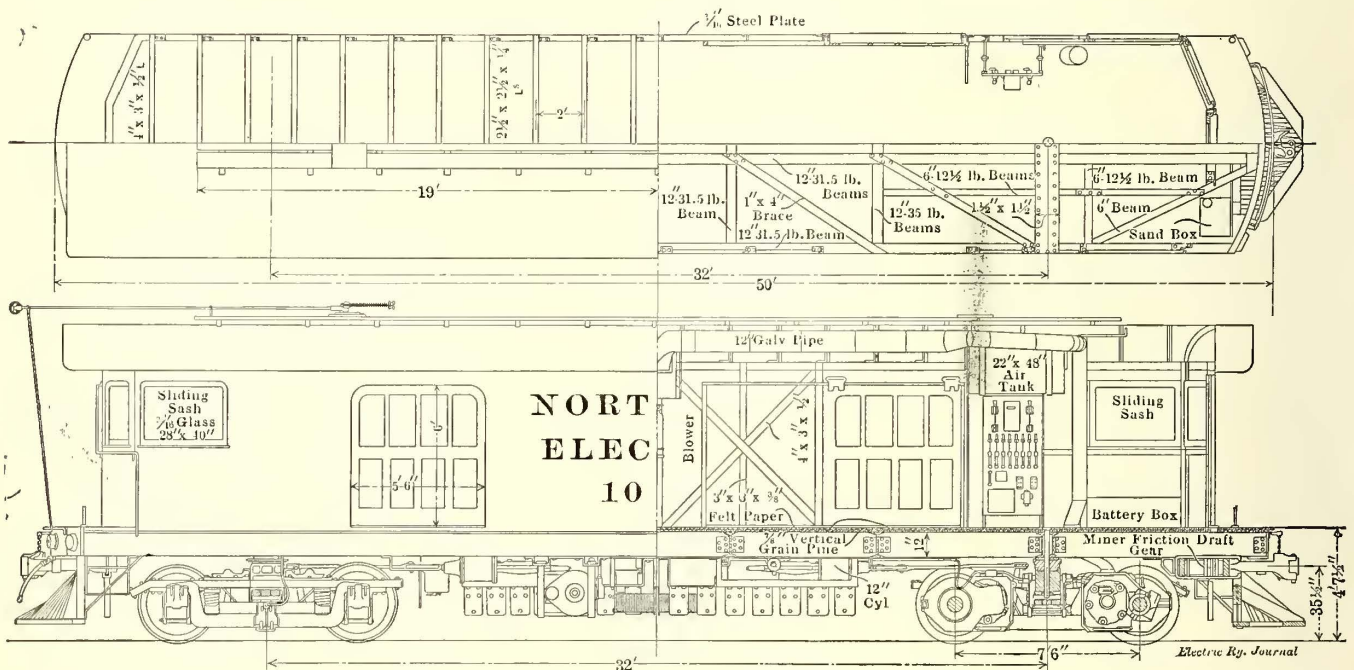
#### CONTINUOUS CAPACITY OF LOCOMOTIVE.

Covers Arranged for Normal Ventilation.	Forced Ventilation.
480 amp at 300 volts	580 amp at 300 volts
440 amp at 400 volts	540 amp at 400 volts
400 amp at 500 volts	500 amp at 500 volts
350 amp at 550 volts	452 amp at 550 volts

The nominal one-hour ratings with 550 volts at the motors are, with natural ventilation, 724 hp, and with forced ventilation, 870 hp.

#### CONTROL EQUIPMENT

The control equipment consists of a double equipment of Westinghouse unit-switch-control apparatus. Provision is made for three running points, with no external resistance in the circuit. The motors may be operated four in series, two pairs in series, or four in multiple. The pair of motors on each truck



Northern Electric Locomotive—Sectional Plan and Side Elevation

not less than 246 amp at 550 volts; continuous capacity not less than 120 amp at 300 volts, or 110 amp at 400 volts, these current ratings being equivalent to the square root of the mean square values of current under operating conditions. Using a gear ratio of 17:60, ratio 3.53, with 36-in. wheels, the efficiency of these motors shall not be less than 85 per cent with gears at full load.

#### LOCOMOTIVE PERFORMANCE

"(A) Based on a total locomotive weight of 80 tons.

"(B) The motors to be provided with adequate means of artificial ventilation.

"(C) Wheels 36 in. in diameter and a gear ratio of 17:60.

"(D) Train resistance not to exceed 3.5 lb. per ton.

"(E) Locomotive resistance not to exceed 6 lb. per ton.

"Based on the foregoing figures the quadruple motor equipment shall be capable of accelerating from rest a train of 750 tons total weight to a speed of 15.2 m.p.h. at the rate of 0.14 m.p.h.p.s. on a 1 per cent grade with a potential of 550 volts at the motor brushes; and, further, the equipment shall be capable of hauling continuously in service at a potential of 550 volts at the motors, a train of 1000 tons gross weight at a speed of not less than 15 m.p.h. on tangent level track."

with its control forms a complete unit and may be operated as a unit or in conjunction with the other set of motors.

The main control apparatus consisting of two line switches, two switch groups, two reversers, series-paralleling switch, change-over switch and resistance grids is attached underneath the sills in two symmetrical groups with all conductor wires and cables run in conduit. In order to leave a clear space for all conduits and air pipes and to avoid making a number of short turns the apparatus was suspended at a distance of from 4 in. to 6 in. below the bottom of the sills. The resistance grids were placed directly below the center sills, and were dropped below the other control equipment to give them free ventilation. Resistance grids of sufficient number and capacity have been installed to provide for the continuous operation of the locomotive at full rated capacity in any resistance control step without overheating the grids. The equipment is double-ended in every respect.

The controllers are of the throttle type, and are provided with push-button control for securing:

- (1) Operation of series-paralleling switch.
  - (a) In series position.
  - (b) In parallel position.

- (2) Reset of both line switches.
- (3) Operation of forward sander.
- (4) Operation of rear sander.
- (5) Operation of bell.
- (6) Operation of whistle.

These combinations are all secured through the use of electro-pneumatic valves, using current from the control circuit at 14 volts for their operation.

The control circuits of the series-paralleling switch interlock electrically with the master controller so that operation from one position to the other can be effected only when the controller is in the off position; this prevents the burning of propulsion circuit contacts should the buttons be depressed during the flow of current through these switches.

Direct-reading ammeters with illuminated dials are installed immediately in front of the controllers and adjacent to the air gages of the brake system. These serve to keep the operator informed at all times as to the ampere demand being made by the locomotive upon the line.

The function of the automatic change-over switch mentioned is to change the trolley and third-rail connections as required. Its operation is automatically controlled by 600-volt interlocking



Northern Electric Locomotive—Interior View of Cab

relays in connection with the trolley and third-rail circuits respectively.

The switchboard is in the number one end and on it are located all the switches necessary for the control of the main and auxiliary circuits. At the top of the board are the two main knife switches controlling the circuits to each pair of motors; between these switches is a recording wattmeter. The knife switches controlling the headlights, interior lights, gage lights, pump and blower motors are located on this board; also the battery switches and the change-over relays. At the back of the board are the governor and headlight resistances, and at the side are the control batteries.

The locomotive interior is illuminated by two five-light incandescent circuits suspended from the roof. The lamp sockets are of marine type in conduit fittings. There is also an incandescent circuit of five lamps placed underneath the body between the sills to provide light for inspection purposes. General Electric luminous arc headlights with semaphore lenses are provided, one at each end, and operate independently, the circuits being controlled by knife switches located on the board.

The locomotive is equipped with Westinghouse automatic air brakes, schedule EL, which includes both the automatic and straight air features. The air brakes are arranged in two units

and can be operated independently, if necessary. Two 12-in. cylinders are used, each one operating on one truck independently of the other. They are both controlled, however, by the same distributing valve, which is located approximately in the center of the locomotive beneath the underframing. Compressed air is supplied by two Westinghouse D-3 compressors controlled by a single governor, but on separate circuits, so that either pump may be operated singly. The pumps are connected with two 22-in. x 48-in. reservoirs through radiator piping, and these reservoirs are equalized through a 1-in. pipe from which the supply is taken. The feed valves are located near the engineer's valves in the end of the locomotive.

A triple trombone whistle and locomotive type bell are mounted on the roof in the center of the body, and are operated by air through magnetic valves which are controlled by push buttons on the master controllers. The electro-pneumatic sanders located in front of the trucks on each end are also controlled by push buttons on the controllers.

#### PAINTING

The steel work of the body was all cleaned thoroughly by sand blast before assembling, and also after being riveted together, and was painted with one coat of Mindura primer; the outside surface was then given one coat of glazier, four coats of surfacer and rubbed down. Four coats of Northern Electric standard orange body color were applied and finished with three coats of standard special wearing body varnish. On the inside one coat each of Mindura field and Mindura finish was applied in addition to the priming, leaving the interior with a black finish. The roof is finished the same as the interior, and all the underframing, equipment and conduits were painted black excepting the air piping and trucks. In order to readily distinguish between the air pipes in the brake system and those of the electrical equipment the former were painted a dull slate color, the latter black.

#### OPERATING RESULTS

This locomotive was placed in regular freight service and tests were made giving the following results: On a light run of 18 miles, with a trailing load of 13½ tons, a maximum speed of 36 m.p.h. was obtained, and an average running speed of 23½ m.p.h. was made with a power consumption of 0.0472 kw-hour per gross ton mile with an average potential of 550 volts. With a trailing load of 850½ tons on a 1 per cent grade, with an average potential of 420 volts, a maximum speed of 10 m.p.h. was reached, and the power consumption on the run of 5 miles was 0.0207 kw-hour per ton mile. With a trailing load of 1145 tons on an 18-mile run, with no stops, and under ordinary conditions, an average speed of 13.3 m.p.h. was maintained, which at times reached a maximum of 24 m.p.h. The average power consumption on the trip was 0.0156 kw-hour per ton mile.

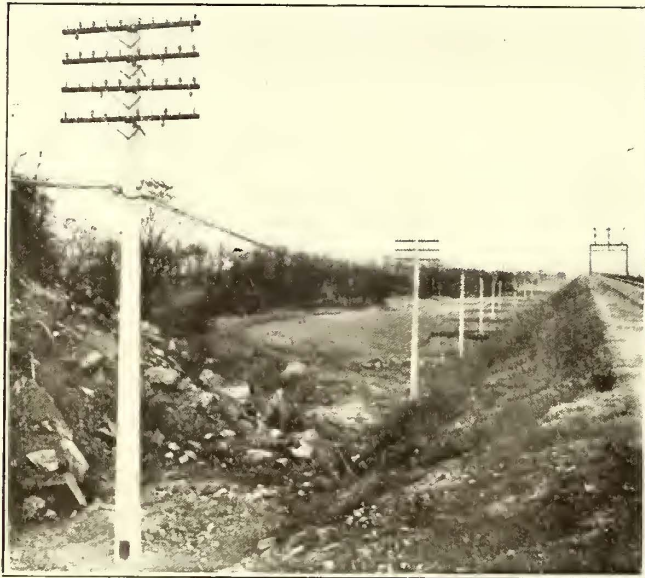
The design of this locomotive conforms, as does all the rolling stock equipment of the Northern Electric Railway, to the standards of the Master Car Builders' Association, and meets the requirements of the Interstate Commerce Commission as to the details of the safety devices.

### CENTRAL STATION INVESTMENTS IN THE UNITED STATES

According to a pamphlet presented by the Electric Bond & Share Company to the members of the National Electric Light Association at the annual convention held in New York City there is an investment of \$2,000,000,000 in central electric stations in the United States, not including the investment in the thousands of miscellaneous isolated plants and those stations devoted to street railway purposes. The remarkable growth in the electric light and power industry can be best realized when it is remembered that the first practicable system of electric lighting was installed as recently as 1879. The first commercial system of incandescent lighting was not put into operation until 1882, while the first alternating-current station was not opened until 1886. Accordingly, the present great development has been the growth of a little less than a third of a century, a period of time during which the entire industrial life of the country has been remade by the electrical discoveries.

## POLE LINES OF THE PENNSYLVANIA RAILROAD ACROSS HACKENSACK MEADOWS\*

The meadows section of the Pennsylvania Railroad entrance to the new terminal station in New York City is a 5-mile continuous stretch of semi-tidal meadow swamp land, except for a short section of rock outcropping at Snake Hill. The Hackensack River is crossed midway of this section. The ground surface is covered with a heavy growth of reeds, and the top



Pennsylvania Railroad—Reinforced Concrete Telegraph Pole

stratum is a peaty bog, from 8 to 15 ft. deep, underlaid with varying strata of clay, fine sand, and mixed sand and clay for very considerable depths. Across this section, and adjoining the track embankment, a pole line was erected for telegraph and telephone purposes, and one for the high-tension power wires.

Ultimately, the telegraph and telephone service will require sixty open wires and two 40-pair cables, and it was desired to make this line entirely secure against probable interruption by severe storms or fires in the swamp reeds. The character of the foundation, as indicated, was bad, and, after much consideration, it was decided to substitute for a wooden pole line, which would be inadequate for the conditions, one of concrete poles, which, while somewhat experimental and perhaps somewhat more costly, would provide a safe and durable construction.

In this section 202 poles were required. They were spaced from 70 ft. to 135 ft. apart, with an average standard span of 120 ft., the variations in span being due to the numerous railway and highway crossings. The heights of the poles above the ground vary from 25 ft. to 50 ft., and they are from 35 ft. to 65 ft. in total length.

The design, made by R. D. Coombs, structural engineer on the staff of the chief engineer of electric traction, called for transverse loading conditions, in case of maximum storms, equivalent to 6000 lb. at 6.5 ft. below the top of the pole for the 120-ft. span length. The poles are square in cross-section, with chamfered corners and with a taper of  $\frac{1}{2}$  in. in 5 ft. The 1:2:4 concrete mixture of which they are made was assumed to have an ultimate unit strength, in compression, of 2200 lb. The reinforcement is composed of mechanical bond bars tied together into a square skeleton frame. In the complete pole this reinforcement is covered by a 1-in. minimum thickness of concrete. The skeleton reinforcement

was placed in horizontal frames, and the concrete mixture was poured in and carefully tamped. A special yard was established near the line, in which to make, store and season the poles. The average number of poles made per day was six, and they were left in place sixteen days to season.

After a number of experiments, it was found best to set the poles in pits excavated in the marshy stratum. These pits were generally about 9 ft. square and 5 ft. deep, and a timber grillage was placed around the base of each pole and about 5 ft. below the top of the ground. This grillage consisted of six track cross-ties bolted together and to the pole, and partly planked over by 3-in. rough lumber. The pole, which projected below the grillage and was pointed at the butt, was jetted down by compressed air into the sandy layer, so that the grillage would rest at the bottom of the pit. The pits were then back-filled with rock and clay. Poles on curves are cross-guyed, and the terminal and railway crossing poles are head-guyed with steel cables.

Because of the unusually heavy line and the extra length required for the foundations, the gross weight per pole, exclusive of grillage and cross-arms is more than would be required for ordinary telegraph poles, and varies from 5300 lb. for a 35-ft. pole to 17,300 lb. for poles 65 ft. in length.

The wires for the transmission of traction energy from the tunnel portal to Harrison substation, and the wires of the high-tension signal power circuits in the same section, are carried on a line of steel poles along the southern edge of the right-of-way across the meadows. These poles are set 300 ft. apart, and are designed for not only the present requirements but to carry seven additional three-wire transmission circuits which may be required in the future. The total loading called for a very substantial pole construction, and also for foundations to be carried through the soft upper strata of the marsh to a firm bearing.

The poles are of latticed structural steel, square in cross-section, with one angle at each corner and single-angle bracing. The poles have a parabolic outline, conforming to the load requirements and giving an improved appearance. The parabola



Pennsylvania Railroad—Setting Reinforced Concrete Pole and Grillage with Air Jet

is of such flat outline that it was not necessary to bend the main angles before assembling. The poles were completely riveted at the shop, with the exception of the cross-arms. The latter consisted of single ship-channels with flanges turned downward. The pole has a cast-iron cap at the top, and a section of pipe to carry a 250,000-circ. mil copper ground wire, which also forms a part of the negative, or return circuit.

\*Abstract from a paper by George Gibbs, entitled, "The New York Tunnel Extension of the Pennsylvania Railroad: Station Construction, Road, Track, Yard Equipment, Electric Traction and Locomotives," to be presented before the American Society of Civil Engineers, Oct. 18, 1911, and printed in the *Proceedings* for May, 1911, page 636.

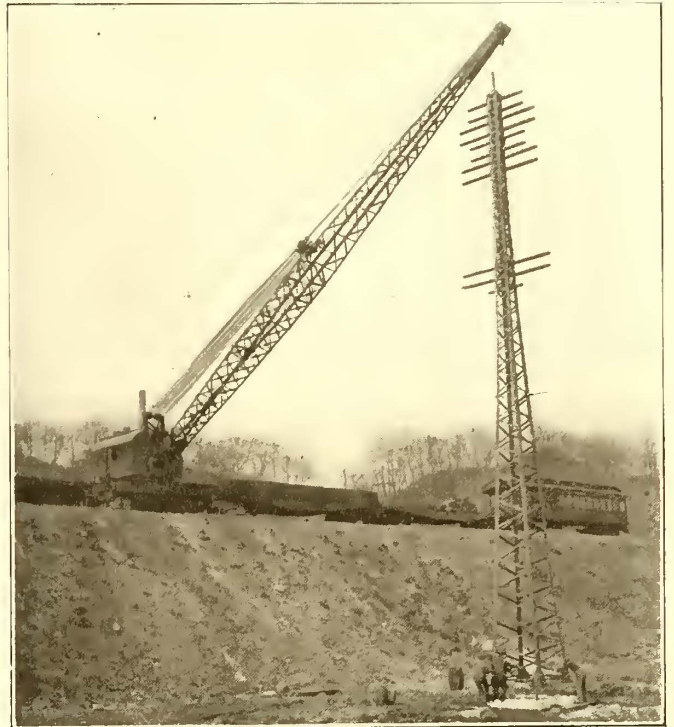
In crossing the Hackensack River it was determined to carry the wires overhead rather than by submarine cables, in order to preserve the integrity of the line against lightning disturbances, and to provide for the use of 33,000-volt transmission in the future. For this purpose it was necessary to carry all wires with the clearance specified by the War Department over navigable streams, and this required the use of two unusually high steel towers. The line approaches the river with 300-ft. spans on 50-ft. poles, rising to an intermediate 70-ft. pole, then sharply to the high towers, 181 ft. 4 in. above high water; the lowest wire in this crossing is 137 ft. 4 in. above high water. The wire span over the river has a length of 765 ft. The towers are of the same general outline as the poles, but of much heavier section and larger dimensions. They are 15 ft. square at the base and 3 ft. square at the top. The tops of the foundations are 6 ft. above high water, and the total height from the water to the ground wire is 195 ft. The towers are carried on twin-pier, reinforced concrete foundations, each having eleven timber piles under it.

The pole foundations across the meadows are of concrete on from eight to ten piles, depending on the size of the pole; the piles were driven to a depth of from 30 to 80 ft., as occasion required.

The poles, both of steel and of concrete, were erected with a standard 75-ton wrecking derrick, fitted with a special 90-ft. boom capable of lifting either the steel or concrete poles at a point 90 ft. from the center of the track. The concrete poles were lifted from the cars on which they were loaded, and placed on timber horses adjacent to the excavation where they were to be set; the cross-arms and grillage were then put in place, and the pole, thus equipped, was picked up at the top and lowered into the excavation. The steel poles were picked up from the embankment, where they had been unloaded, and lifted by the derrick vertically over the foundation and set in place.

All high-tension insulators are of porcelain, of the petticoat type. Straight-line insulators are made of three pieces, and

various railroads in the meadows section and the city streets in the Sunnyside yard section were provided with double cross-arms, strain insulators, and a dead-end clamping device designed to attach the power wires securely to the structure.



Pennsylvania Railroad—Setting Transmission Line Pole with Derrick Car

At the Hackensack River the power line rises sharply, in one span, to the top of the high towers, and required special



Pennsylvania Railroad—Transmission Line Across Hackensack Meadows

strain insulators of two pieces. These insulators are mounted on cast-steel pins bolted to the steel channel cross-arms. The transmission line poles supporting the spans crossing the

insulating attachments. Each power wire, in passing over the steel cross-arms of the tower, is carried in a saddle supported by a nest of four standard line insulators. The saddle is pro-

vided with a special six-bolt clamp, and its wire groove is curved to prevent sharp bending.

The 2,000,000-circ. mil direct-current feeders, in addition to a similar clamping saddle, have an auxiliary butterfly clamp on each side, about 2.5 ft. from the saddle and attached thereto by adjustable rods.

In addition to the present signal circuits through the yard, and feeding the New York division at the Passaic River, the pole line is arranged to carry in the future two three-wire, high-tension power circuits.

## PENNSYLVANIA COMMISSION REPORT ON THE PHILADELPHIA RAPID TRANSIT COMPANY

The full text of the report on the Philadelphia Rapid Transit Company, made by Ford, Bacon & Davis to the Pennsylvania State Railroad Commission, has just been made public by the commission. It consists of two volumes. One contains the text of the report and occupies 142 pages. The other contains the tabulated statements, maps and diagrams, and has 158 pages and thirty-four maps.

### SUMMARY OF THE REPORT

A summary of the report was made public by the commission about a month ago and was published in the *ELECTRIC RAILWAY JOURNAL* for March 18, 1911, page 455. The report is dated March 7, 1911, and the information was secured during the period from June 1, 1910, to Feb. 1, 1911, so that the date of the report may be considered as Feb. 1, 1911. The statistics of physical property and operation are principally as of June 30, 1910, or the year ending with that date. The observations of traffic and service are largely of September and October, 1910. The report discusses in extent the physical property of the company, the operating statistics from 1907 to 1910, car maintenance, accidents, traffic and service, the rush-hour problem and car routing.

The extent of the report precludes an abstract of its entire contents in this week's issue of the *ELECTRIC RAILWAY JOURNAL*, but a summary will be given of the recommendations in regard to track construction and cars. The consideration of the subject of cars is probably the most extended discussion of the design of city cars contained in any of the many reports published of individual systems. The following paragraphs are taken from the report:

### RAIL

"In 1903 a 9-in. 141-lb. rail was adopted as standard in Philadelphia. Since that time it has been used almost exclusively in paved streets and now constitutes 35 per cent of the total track. In the weight of the rail and its average age the report says that track in Philadelphia is superior to that in other large American cities, except in Chicago, where the track system has been largely reconstructed during the last four years. The desirability of using a rail as heavy as 141 lb. per yard may be questioned, however, in view of the development of light weight cars. A portion of the track is laid in concrete, but with this exception practically all track in Philadelphia is laid without foundation or ballast. This results generally in poor line and surface, but not to an extent to impair seriously the riding qualities of the track. No preservative treatment for ties has been adopted. On the heavy rail an expensive patented joint has been used, with excellent results.

### SPECIAL WORK

"On account of the wide and uniform distribution of population and of the narrow streets requiring the use of single track more special work is required in Philadelphia than in all other large cities. Of this special work about 71 per cent is of hard steel center or solid manganese construction. Great care has been given to all details of design.

### IMPORTANCE OF PROPER SELECTION OF CARS

"The car is the most important part of the street railway property from the standpoints of both the public and the company. Upon the car design depend largely the comfort and satisfaction of the passenger on the one hand, and, on the other,

the amount of riding per capita per year and the cost of operation. A street railway company may store its cars in dilapidated barns or in the open air, may supply itself with power from a plant of poor design and may even have its track and overhead line of inferior standard, yet it may render satisfactory service to the public, provided its cars are modern, comfortable, cleanly and well maintained. Defects of the other portions of the company's property increase the cost of operation. Up to 1900 single-truck cars were the standard in Philadelphia and practically all of these cars have been retained in operation, although some of them have been rebuilt into slightly longer double-truck cars by splicing and reconstructing them and by their conversion into pay-within cars. At present the percentages of single-truck and double-truck cars, including both open cars and closed cars, in New York, Philadelphia and Brooklyn are as shown herewith:

	Total Number of Sur- face Cars.	Per Cent Single Truck.	Per Cent Double Truck.
Philadelphia .....	3,292	63.3	36.7
New York City* .....	3,200	25.0	75.0
Brooklyn .....	3,023	8.9	91.1

\*Two largest companies.

"On the two Chicago surface systems there are 2925 cars, of which approximately 75 per cent are double-truck cars.

### LIFE OF CARS

"From the standpoint of wear and tear, a car, if well maintained, can be preserved almost indefinitely, as each part when worn out would be replaced with new material. Its economical life, however, can be definitely ascertained.

"In the case of steam railroad passenger equipment the useful life of cars is often from thirty to forty years. With steam railroad freight cars, however, as the first cost of the car is comparatively small and the type of equipment has changed so rapidly, due to the economy of operating large units, it has not been found desirable to retain cars for a longer average life than from fifteen to twenty years. The same principle of economical operation has sealed the fate of the single-truck street railway car for use on congested lines of many large street railway systems. With the advance in the art, with the careful design of the car to embody all presently conceivable points of operating efficiency and with the requirement by public opinion and governmental authority to charge the cost of replacement to income account instead of to capital, it is believed that the modern street car with proper maintenance will have a life considerably in excess of fifteen to twenty years and probably as much as steam railroad cars of a settled economical design, the life of which is placed by competent authorities at from twenty-five to thirty-five years.

"The small single-truck car has its usefulness in street railway systems in large cities for lines of light, regular traffic which do not traverse the congested tracks of the down-town delivery district. Philadelphia has a large amount of track mileage and a large number of separate lines for the population served. It would therefore be expected that a larger proportion of single-truck cars can be used to good advantage in Philadelphia than in the other cities named. The principal objection to single-truck cars is to their limited size and not to the four-wheel truck. A modified design of the latter, such as a radial axle truck, may permit the use of longer car bodies and thus remove this disadvantage. During the last ten years only 655 double-truck closed cars and 100 subway-elevated cars have been added to the Philadelphia system. In New York City the two principal surface companies have added 1472 double-truck cars, the Brooklyn system 1007 double-truck cars and the Chicago systems 2200 double-truck cars. In Philadelphia, as of Jan. 1, 1911, 700 cars have been converted to pay-within cars. This represents 67 per cent of the company's double-truck closed (including maximum-traction) cars and 34 per cent of total double and single-truck closed cars owned. On an average about 40 per cent of the maximum cars operated in winter are of the pay-within type.

### COMPARISON OF DETAILS OF STANDARD SURFACE CAR DESIGN AFFECTING THE TRAVELING PUBLIC

"Considering surface car design from the standpoint of the



public, there should be adopted, wherever practicable, those features, both large and small, which contribute to the safety, comfort and convenience of the street car traveler.

#### SIGNS

"Taking up the various points of design as they would be encountered by the passenger, the first items of importance as the car approaches are the line and destination signs. In the Philadelphia car there is a wooden sign, not illuminated, on each upper side deck, giving the line designation. An additional glass sign is placed on the end of the vestibule hood, illuminated from the car lights, which generally gives the car destination. The objectionable features of these Philadelphia car signs are, first, poor illumination, and, second, the lack of a definite system of designating line or destination.

"In Boston the route and intermediate points are designated by wooden signs on the front and rear hood and on the sides of the lower deck, not illuminated. The destination signs are removable steel plates in the middle vestibule space under the hood, specially illuminated, and in addition metal disks show the division number.

"In Brooklyn translucent line signs are shown in the ends and sides of the car monitor, and wooden block destination signs are placed in the corner, specially illuminated. The two New York companies and the two Chicago companies use 'Hunter' cloth signs either in the front and sides of the car monitor or in the middle of the vestibule under the hood, and in the upper part of the windows at the center of the side of the car. The monitor signs are illuminated from the car and the vestibule signs by lamps provided for the purpose.

"It is recommended that transparent line signs be provided for front, rear and sides of the monitor, illuminated by the lights in the car, and in addition a destination sign in the center of front and rear vestibules under the hood, independently illuminated.

#### STEP HEIGHT

"In boarding the car the first feature of interest to the passenger is the step. On the present double-truck closed cars in Philadelphia the height of the first step from the ground varies from 15½ in. to 17¾ in., while with the single-truck closed cars this is as low as 11 in., and with the open cars it ranges from 17½ in. to 20½ in. The second step on the closed cars averages 13½ in. and on open cars 15 in., while the third step from the platform to the interior of the car varies from 5¼ in. to 9¾ in. for the double-truck cars and 5½ in. for the single-truck closed cars, while, of course, on the open cars the platform is at the same level as the interior. With the New York and Brooklyn maximum-traction cars the first step ranges from 14½ in. to 15½ in., the second step is 13 in. and the third step averages 9¼ in. In the Chicago cars the first step ranges from 16½ in. to 18 in., the second step averages 14 in. and the third step 11 in., while with the Boston car there are three steps to reach the platform, these being 15½ in., 12 in. and 11½ in. The height of steps on closed cars where there are two steps from ground to platform and one step from platform to interior is dependent on type of truck used, diameter of wheel, design of bottom framing and size of motor. With the standard double-truck four-motor equipment the height of the car floor from the ground (which is here assumed to be even with the head of the rail) is, of necessity, from 38 in. to 42 in. or more, and this involves a first step of about 16 in. With the use of the Metropolitan type of maximum-traction car it is possible to reduce the total height of car floor from ground to 37½ in. and to reduce the height of the first step to 15 in., a convenient height of the second and third steps being 13 in. and 9½ in.

"If the use of a radial-axle, single-truck type of car with large motors proves to be practicable, it would permit a still further reduction of about 1½ in. in the total height of the car floor from the ground and height of steps. Any reduction in the height of steps is a matter of great importance, especially to women and children. The reduction of 3 in. in the height of the first step of the Metropolitan cars below

that of the type previously used was the cause of much favorable comment.

#### TREAD WIDTH

"To decrease the liability to accidents it is also important to provide that the width of the step should equal about the length of the foot, or from 10 in. to 12 in., so that the passenger when alighting is able to rest the entire foot on the step, as against the ladder effect of a narrow step. The Philadelphia pay-within cars are well designed in this particular, as the width of the step is 12½ in. In the other cars considered this width varies from 10 in. to 10¾ in., although in Boston, with the use of three platform steps, it is reduced to 8¾ in. The effect of a narrow tread and a high step upon step accidents is quite noticeable in the case of open cars where, as in the Philadelphia cars, the running board is 7½ in. wide and the steps as high as 20 in. or more. With regard to the kind of tread to be used, the Philadelphia pay-within cars have a hinged step with wooden tread, while standard cars of New York, Brooklyn and Chicago have the 'Universal Safety' or the 'Mason' tread, which is a metal plate with soft metal inserts. The use of a safety tread and also of folding or protected steps is recommended, the latter preventing 'hanging on' when the step is not in use.

#### PREPAYMENT CARS

"A prepayment system of fares necessitates that the entrance be on the rear platform and that the entrance and exits be controlled by the conductor or motorman. From the standpoint of safety and convenience to the passenger, businesslike methods of fare collection and proper control of the car operation by the conductor, the prepayment plan with the use of operating platform doors is a great improvement in car design. In Philadelphia 726 cars were on order to be equipped with the pay-within system on Sept. 15, 1910.

"The principal difficulty with the Philadelphia pay-within cars seems to be in the use of too small a rear platform and narrow rear platform door, these necessitating the location of the conductor inside the car bulkhead, where he is in the way of free passenger movement and prevents the entrance and exit simultaneously of two lines of passengers.

#### SINGLE-END CARS

"The usual prepayment plan with entrance and exit from rear platform and exit only from the front platform lends itself especially to the single-end type of car. The objections to the operation of single-end cars would not seem to apply with the usual force to the street railway system of Philadelphia, as 58 per cent of the line is single track practically all operated in one direction. The single-end cars eliminate a certain amount of weight and first cost, besides saving from 2 linear ft. to 3 linear ft. in the amount of track space occupied and about 6 in. in length of rear platform.

#### SIZE OF PLATFORM

"The rear platform of a prepayment car should be of sufficient size to permit of the independent entrance and exit of passengers at the same time. Allowing a width of 23 in. each in the clear for entrance and for exit means practically a 4-ft. opening at the step. The present opening on the Philadelphia standard car is 34½ in. for a platform 4 ft. 2 in. in length. This compares with a total opening in the New York prepayment cars of from 4 ft. to 5 ft. with platforms from 5 ft. 10 in. to 6 ft. 10 in. in length, and with total openings in the Chicago cars of about 4 ft. 7 in. and platforms from 6 ft. 1½ in. to 6 ft. 3¾ in. in length, all lengths of platform being inside measurements from bulkhead to dash.

"Experience and test have proved that for a 28-ft. to 30-ft. car a platform of from 5 ft. 6 in. to 6 ft. (inside) is of sufficient length to accommodate the usual passenger loads at average heavy stops.

"With the use of the maximum-traction type of truck similar to the New York (Metropolitan) car it would be possible to separate the truck centers sufficiently so that the overhang on the outside of curves with a 28-ft. car having a platform 5 ft. 6 in. (inside) would not be greater than that of the bumper of

the present Philadelphia standard car. This length will provide room for the conductor on the platform.

#### PLATFORM DOORS

"Another serious objection to the Philadelphia pay-within car is the sliding platform door. This type of door, besides being difficult to keep in line, involves a heavy mechanism usually required to be operated by air. This is expensive, requires frequent adjustment and in case of disarrangement or accident it is difficult for a passenger to release. Probably the most serious objection to the sliding door, however, is the necessary pocket into which it slides in the side of the car, which contracts the space at the car entrance, where congestion is most apt to occur. The combination of this narrowing of the neck of the bottle, together with the location of the conductor at the same point as a stopper, forms, it is believed, the most serious objection to this present type of car.

"On the New York and Chicago prepayment types of car a sliding platform door is used for the right-hand side of the front platform, providing an exit from 24 in. to 27 in. in width and folding doors on the right-hand side of the rear platform locked open while the car is in operation. The front door is opened either by the passenger or by a motorman's hand lever, or automatically by release of foot lever, and is locked shut by the motorman. On the rear platform a pipe stanchion divides the entrance and exit, and a pipe rail separates the exit and shields the conductor from the entering passengers.

"It is recommended that for the Philadelphia standard car folding platform doors be provided similar to those frequently used on the Minneapolis or pay-within types of car and also used recently in connection with the pay-as-you-enter car. These doors should be operated mechanically, the front platform door being operated by the motorman and those on the rear platform either by the conductor or motorman. The operating device should be under the control of the car operatives, and so simple that in case of accident the door could be opened by passengers.

#### BULKHEAD DOORS

"With the use of the pay-within type of platform door the bulkhead doors may be omitted, as in this case the platforms are closed to the weather. This eliminates some weight and expense and permits a freer movement of passengers. In sleet storms the motorman is sometimes obliged to lower the vestibule sash. This might necessitate a folding cab or shield behind the motorman to protect the passengers.

"In the New York and Chicago prepayment cars, as the rear platform doors are not used in operation, bulkhead doors are required, these in the case of the Chicago pay-as-you-enter cars being single sliding doors providing 23-in. openings, and in the case of the New York prepayment cars being double sliding doors providing openings of the same width.

"In the present Philadelphia standard car the bulkhead passageway is 28½ in. wide, but is, however, as stated, somewhat obstructed by the location of the conductor at this point. It is recommended that the widths of the entrance and exit at the bulkhead be not less than 23 in. each, these two passageways being conveniently separated by a pipe stanchion.

#### GRAB-HANDLES

"For the safety and convenience of passengers entering and leaving cars, grab-handles are installed in the Philadelphia car on the body and vestibule corner posts of both platforms. In the New York and Chicago prepayment cars a grab-handle is installed on the front vestibule corner post, and for the rear steps of the Chicago cars on the body and vestibule corner posts, the pipe stanchion from platform to hood acting also as an additional grab-handle at this point. On the New York cars there are grab-handles on the rear body corner posts but none on the vestibule corner posts of the rear platform, as passengers entering the car should properly grasp the pipe stanchion at the right hand.

#### FARE COLLECTION AND REGISTRATION

"With the Philadelphia pay-within car the conductor collects the fare at the bulkhead entrance and makes change in the

usual manner, registering the fare by hand register cord. In the New York prepayment cars the conductor makes change on the rear platform, the fare being placed in a removable cash box. On the Metropolitan car the registering of fares is by hand strap or foot lever, but on the Third Avenue car registration is made by registering fare box. On the Brooklyn car the fares are collected by the conductor without prepayment being required and are registered by hand register cord. On the Chicago car the conductor collects fares on the rear platform, registering by foot lever, with a hand cord for emergency. On the Boston car fares are collected by the conductor without prepayment, cash and ticket registers being provided, operated by hand cords. The location of the conductor on the rear platform and prepayment of fares are recommended, and the method of cash collection and registration should be such as suit the convenience and reliability of the company's accounting system.

#### SEATS

"Probably the most serious popular indictment against the Philadelphia standard car is the discomfort of the longitudinal seats, caused largely by their dimensions and form. In view of the fact that the car trips in Philadelphia are 50 per cent longer than in other large cities and that the surface car rides of a large number of the passengers are of necessity of great length due to there being few high-speed lines in this large area, comfortable seating arrangements for passengers should be provided.

"In the cross-seat double-truck car at present in use in Philadelphia there are twelve double cross seats for twenty-four passengers and four longitudinal seats seating four each, or a total capacity of forty seats. This car is 8 ft. 6 in. in width over all and, with cross seats 33 in. long, has an aisle 21½ in. wide. When converted into the pay-within type it has a seating capacity of thirty-eight at the usual spacing for longitudinal seats of from 17 in. to 18 in. per seat. The four small longitudinal seats in front of the platform door pockets, however, are extremely uncomfortable, due to their being little more than a shelf 13½ in. wide, with a straight back only 10 in. high. These spaces, representing eight seats out of the thirty-eight, or over 20 per cent of the seating capacity, cannot be much improved without a more serious interference with the passenger movement, but they should never be duplicated.

"The main longitudinal seats in this pay-within car are 18½ in. in height, 17 in. wide, have a slope of 1½ in. and are constructed of spring rattan; the backs are 12 in. high, have a slope of 3½ in. and are made of rattan backed with wood. They are not comfortable, however, due largely to the fact that the backs are too low, are not constructed of spring rattan and neither seats nor backs have the proper slope. If the backs were constructed of spring rattan it would make them more comfortable, although in the New York (Metropolitan) cars, where both seats and backs are constructed of rattan without springs, but backed with felt and wood, a comfortable seat is provided by a proper curvature of seat and back, this tending to prevent slipping.

"One of the most comfortable longitudinal-seat cars ever built is the Philadelphia (People's Traction) 20-ft. box car. If the design of the seats in that car were duplicated for the longitudinal seats of the pay-within car there would be a considerable improvement. These seats are properly sloped and the backs are of spring rattan and 16 in. in height. It is recommended that the longitudinal seats and backs which are retained in the pay-within cars be remodeled along the lines of these or of the Metropolitan seats. By making a moderate expenditure for this improvement the comfort of these cars can be largely increased.

"The standard cars of Chicago, with 32-ft. bodies, seat forty, of which twenty-eight are on cross seats and twelve on longitudinal seats at the ends of the car. In the New York (Metropolitan) car the capacity of seats, all longitudinal, is forty-two, exclusive of five front platform seats, while that of the Third Avenue car, exclusive of three platform seats, is forty-four, of which forty are cross seats and four longitudinal.

The Brooklyn car has thirty-six longitudinal seats and the Boston car fifty-two seats, of which thirty-six are cross seats and sixteen longitudinal. In all of these the seats and backs are made of spring rattan except in the Metropolitan and Boston cars, the former having rattan backed with felt and concave-shaped boards, and the latter having wooden slats. The length of these cross seats varies from 31 in. to 34 in. and the spacing between centers from 28½ in. to 31½ in.

STANDING ROOM

"The standing room of a surface car is considered as the available aisle and platform space. From experience and test of various types of cars it has been found that an available standing space of 4 sq. ft. per standing passenger provides sufficient room for comfort and for free movement through the car. This for a longitudinal-seat car means practically two rows of standing passengers in the car, providing aisle space for passenger movement between. Application of this rule to the Philadelphia pay-within car, with allowance for entrance space on rear platform, would result in thirty-eight standing passengers or the same number as seated, permitting a total load of seventy-six.

"For the Philadelphia cross-seat 28-ft. car (type E-42) this rule would result in twenty-nine standing passengers and forty seated. For the other cars it would result as follows:

	PASSENGER CAPACITY		
	Seated	Standing	Total
Metropolitan .....	42	42	84
Third Avenue .....	44	26	70
Brooklyn .....	36	36	72
Chicago .....	40	36	76
Boston .....	52	39	91

"Therefore, for a longitudinal-seat car this rule means generally as many passengers standing as seated, while for the cross-seat car the standing passengers will represent from 60 to 90 per cent of the seated passengers. The total seating and standing capacity of the longitudinal-seat car is therefore about 10 per cent greater than that of the cross-seat car of the same dimensions.

"In a 28-ft. cross-seat car body with platforms 5 ft. 6 in. (inside), which for the purpose of this report is assumed as the future Philadelphia standard, the standing capacity would be approximately thirty-six in addition to forty seats. While the standing capacity is based on 4 sq. ft. per standing passenger, the total seated and standing capacity of the interior of the car will equal about 3½ sq. ft. per total seated and standing passenger, which is about the same proportion as exemplified by recent American practice and certain governmental regulations abroad.

STEADYING METHODS

"The steadying methods inside of the Philadelphia standard car consist of thirty-six leather straps, four stanchions at the bulkheads and two conductors' stands. On the Metropolitan and Brooklyn longitudinal-seat cars there are thirty-two and thirty-four leather straps respectively and in the Metropolitan car there are pipe stanchions on front and rear platforms and conductor's rail on rear platform. On the Third Avenue, Chicago and Boston cross-seat cars there are corner hand-holds or grab-handles on the back of each cross seat, with from eight to sixteen leather straps over the longitudinal seats, and in the case of the Boston car fourteen additional leather straps over the cross seats. The height of the leather straps varies from 5 ft. 2 in. to 5 ft. 11 in., a fair average being 5 ft. 7 in., used in Philadelphia and New York.

"It is understood that experiments are now being made by the company on the use inside the car of vertical pipe stanchions, which if used should have sanitary or white enameled coating. Hand-holds or grab-handles should be used on the back of each cross seat and in the case of longitudinal-seat cars careful consideration should be given to the sanitary or white-enameled horizontal hand rail of the Hudson Tunnel car in connection with the vertical stanchions and also to the steady-holds used in place of straps in the latest type of New York subway car. The latter are made of iron, white enam-

eled, and hinged in the direction across the bar but immovable as to the lengthwise direction. They are hung in the same position as the usual leather straps at about the same height, but when not in use a spring draws them somewhat away from the aisle.

"Additional steadying devices are needed in the pay-within car, as is shown by the large number of accidents from passengers falling on platforms and in the car. Some of the above methods should be adopted inside the car, and pipe stanchions, rails or grab-handles installed on platforms.

WINDOWS AND VENTILATION

"Objection has been made to the lack of airiness in the present Philadelphia standard car in summer and also as to poor ventilation in winter. Statistics were collected showing the area of front and side openings of this and other cars available for passage of air as operated in summer. The area of the front opening of the principal types of Philadelphia cars is as follows:

	Area Front Openings (sq. ft.)	Ratio Front Openings to Front Area
Pay-within car .....	16.2	24.9%
28-ft. cross-seat car.....	6.1	9.4
20-ft. single-truck car.....	5.1	8.4

"The total area of side openings of windows and monitor ventilators on these cars (not allowing for removal of fixed sash) follows:

	Area Side Openings, Windows and Monitors (sq. ft.)	Ratio Total Side Openings to Side Area	Ratio Total Openings to Total Area, Front and Side
Pay-within car .....	48.0	20.8%	21.7%
28-ft. cross-seat car..	15.6	6.8	7.3
20-ft. single-truck car.	8.2	5.0	5.9

"As these figures show that the pay-within has much larger available window openings than the cross-seat car, it would seem that the apparent lack of air movement is due to the arrangement of the seats. In the cross seat the passenger is facing the front of the car and would notice a current of air which is not perceptible in the longitudinal seat.

"A comparison with the window openings of cars of other cities is as follows:

	Area Front Openings (sq. ft.)	Ratio Front Openings to Front Area	Area Side Window Openings (sq. ft.)	Area Side Monitor Openings (sq. ft.)	Ratio Total Side Openings to Side Area	Ratio Total Openings to Total Area, Front and Side
Metropolitan...	7.6	11.2%	59.2	7.3	25.4%	22.2%
Third Avenue..	7.3	11.0	107.2*	7.8	47.3	39.5
Brooklyn .....	6.3	9.8	82.6*	10.0	40.3	33.6
Chicago City Ry.	19.2	27.5	76.9	14.0	34.7	33.2
Chicago Rys...	16.4	23.5	55.5	4.0	23.1	23.2
Boston .....	8.7	13.5	71.2	9.7	28.5	25.7
Philadelphia ..	16.2	24.9	27.3	20.7	20.8	21.7

\*Summer operation.

"It should be noted that these figures do not include for the Chicago City car patented ventilators in front and rear monitor, ventilators on floor of car and ventilators on top of hoods; neither do they include the special ventilating system used in the Chicago Railways car, nor the openings in side vestibules of the Boston car.

"The Philadelphia car of type E-41, which is a 28-ft. semi-convertible car changed to pay-within type, has much larger side window opening than the other pay-within cars, this being 53.8 sq. ft., which gives it a ratio of total side and front openings to total area of 27.4 per cent. The area of all window openings of the Philadelphia pay-within car compares favorably with the cars of other cities named, the only cars having an appreciably larger ratio of window opening being the Chicago City, Third Avenue and Brooklyn cars, which last two types have removable sides and windows. With a car having longitudinal seats it is believed to be undesirable to remove the windows in summer, and it would seem that no material improvement can be made on the present pay-within cars in this particular if the use of longitudinal seats is continued. For a new standard car, however, it is recommended that the side window openings be considerably enlarged.

WINDOW GUARDS

"The Philadelphia car uses a double-bar side window guard and the Third Avenue, Chicago and Boston cars all use iron screens from 12½ in. to 2 ft. 6 in. wide. The Metropolitan and Brooklyn cars use no side window guards, the necessity for these being determined by the clearance between cars on double track.

HEATING AND VENTILATION

"The difficulties of surface car ventilation in the winter time are to an extent bound up with the question of car heating. The use of the usual hinged or pivoted monitor window ventilators produces drafts. In some of the recent steam railroad passenger car designs ventilation is accomplished entirely by means of roof or special forms of monitor ventilator. The two Chicago companies have made many experiments on this subject and use several different types of ventilators, none of these types being largely in use in other places. With the limited volume of air in proportion to door area and the frequent opening of doors it is a difficult problem to provide a system of uniform ventilation without draft and at the same time to furnish sufficient heat.

"It is recommended that the monitor windows be fixed and that ventilation be obtained from a sufficient number of automatic roof or monitor ventilators. These provide fixed openings for air to be admitted and discharged. Their use has demonstrated that the car temperature can be kept at the proper point, at the same time providing good ventilation.

"In order to compare the Philadelphia standard car with other Philadelphia types and with cars of the four other cities, all of which are heated by electricity, a ready method is to divide the volume of air to be heated by the number of amperes of current represented by the rated capacity of the heaters used for this purpose. The result is the number of cubic feet of air to be heated per ampere of current. In the Philadelphia pay-within car this is 335 cu. ft. per ampere as compared with 154 cu. ft. for the 24-ft. maximum-traction car and 131 cu. ft. for the 20-ft. single-truck (People's Traction) car. The smaller cars are well heated while the pay-within car is insufficiently heated. Comparative figures for other cars are as follows:

CAR HEATING		
	Volume of Air to be Heated per Ampere (cu. ft.)	Number of Heaters per Car
Metropolitan	146	16
Third Avenue	149	16
Brooklyn	126	6
Chicago City	160	18
Chicago Railways	158	18
Boston	215	22
Philadelphia	335	6

"The number of heaters in a car is important as affecting the distribution of heat throughout the car. It is recommended that the heaters in the pay-within (E-44) type of car be doubled in number and in capacity in order to give the proper distribution and amount of heat.

LIGHTING

"In the Philadelphia pay-within car there are eight incandescent electric lights inside the car, arranged in three clusters in the ceiling. This is the same number and arrangement as in the small 20-ft. single-truck closed car and also in the 24-ft. maximum-traction car. In addition there is one lamp on each platform. The interior lighting of these cars compares with other cars as follows:

NUMBER OF LIGHTS INSIDE CAR	
Metropolitan	16
Third Avenue	15
Brooklyn	16
Chicago	21
Boston	16
Philadelphia	8

"The Philadelphia pay-within car lighting is manifestly insufficient and the number of lamps in the car should be doubled. The lighting will be better distributed by using single socket lamps placed in one row along the monitor ceiling and another row on each side of the lower deck. In order

further to compare the lighting of these cars on a basis of ready approximation, the volume to be lighted inside of the car is divided by the number of lamps times 16 cp, which will give the number of cubic feet to be illuminated per candle. This figure for the pay-within car is 12.2 cu. ft. as compared with 8.4 cu. ft. for the 24-ft. maximum-traction double-truck car and 7.1 cu. ft. for the 20-ft. single-truck car. Comparison with the car lighting in other cities is as follows:

CAR LIGHTING	
	Volume of Space to be Lighted per Candle (cu. ft.)
Metropolitan	6.9
Third Avenue	7.1
Brooklyn	5.9
Chicago City	4.5
Chicago Railways	4.3
Boston	7.3
Philadelphia	12.2

"From one to two lights should be used on each platform, depending on its size, and additional lights are needed for the headlight and the independently illuminated destination signs.

BRAKING

"The Philadelphia cars of all types larger than the single-truck car have both air and hand brakes, the hand brakes being controlled either by vertical wheel or horizontal ratchet handle. The single-truck cars have hand brakes operated by horizontal ratchet handle. The sanding device used on the Philadelphia car is the old-fashioned bucket of sand and scoop, the sand being shoveled out by the motorman and thrown into a hopper. On the single-truck type of car there is apparently no sand equipment used. In the interest of safe operation all cars should be equipped with a sanding device. Either the mechanical or the air sander is satisfactory. The New York, Brooklyn and Boston cars have mechanical sanders, and the Chicago cars air-operated sanders.

FENDERS

"The Philadelphia cars are equipped with an extension fender constructed by the company consisting of a pipe frame inclosing a rope net, the fender being hinged to the car by brackets and suspended by chains from the dash. The fender has a projection of 29 in. from the bumper. These fenders are fairly effective for extension fenders, but are poorly maintained and are unsuitable for operation in the congested streets of large cities, where the use of an automatic wheel guard has been found to be highly effective. The projecting brackets attached to the car for the support of these fenders are also objectionable, as they afford foothold for 'hangers on' at the rear end. The practice in New York and Chicago and in the downtown districts of Brooklyn has been to abandon the projecting fender and in its place to use a patented automatic drop wheel guard. It is recommended that wheel guards of this type should generally replace in Philadelphia the projecting fender for moderate speed operation where pavement and track conditions permit, and that for high-speed operation in the suburbs an approved projecting fender be used in addition.

DRAWBARS

"The drawbars used on the Philadelphia car are of the plain spring non-telescoping type, the projection of the drawhead beyond the bumper being 7 in. and that of the bar 11 in. This form of drawbar is objectionable, as in cases of persons struck, even if the fender acts efficiently, the projection of drawbar or head will often cause injury. On the rear of the car it affords standing space for 'hangers on.' The cars of New York, Brooklyn and Chicago have the fixed-jaw type of drawhead with removable bar, which is usually carried under the side sill. It is recommended that this flush type or a telescoping type of drawhead and drawbar be used on the new standard Philadelphia car, and also on the present cars upon the adoption of wheel guards."

SUBWAY-ELEVATED CABS

But few changes are recommended in the cars used in the Philadelphia subway-elevated system. The principal one is that in future cars longer platforms should be adopted with side-platform door opening at least 47 in.

## RECOMMENDATIONS AS TO CARS

The report suggests that the new standard surface car used in Philadelphia should be a 28-ft. two-motor cross-seat prepayment car with platforms measuring 5 ft. 6 in. inside and with windows capable of large opening to make the car suitable for both summer and winter operation. If the width of this car was 8 ft. 4 in. with skeleton sides and 34-in. cross seats, the aisle could be 28 in. wide. The reporting engineers believe that a car of this size, but without a projecting fender, could be used on the company's standard track curve for right-angle intersections in 50-ft. streets.

The report goes on to recommend the operation of the service with three classes of cars, as follows:

1. Use for all-day operation on lines of heaviest traffic the proposed standard two-motor, double-truck cars as far as the number purchased will go, and beyond that the present four-motor double-truck cars.

2. Use for all-day operation on lines of light traffic not running through the delivery district the two-motor single-truck cars now owned.

3. Use as far as practicable for rush-hour tripper service a combination of the present four-motor double-truck car with a specially designed light-weight trailer of large capacity.

The use of trailers is recommended partly for the sake of economy and partly to increase the capacity of crossings.

The report then specifies the following details of these proposed standard surface cars.

## DETAILS OF NEW STANDARD SURFACE CAR ESPECIALLY AFFECTING THE TRAVELING PUBLIC

## SIGNS

"It is recommended that there be made an entire rearrangement and standardization of the system and nomenclature of line and destination signs. Transparent line signs should be used on the front, rear and sides of the monitor, illuminated from the car. A destination sign, independently illuminated, should be placed in the center of the front and rear vestibules directly under the hood.

## STEPS

"The height of first step should be from 14 in. to 15 in., second step 13 in. and third step from 9 in. to 10 in. The first step should be folding or protected. It should be at least 11 in. wide and should be provided with a safety tread.

## DOORS

"Folding platform doors should be mechanically operated by motorman or conductor. This mechanism should be so simple that in emergency a passenger can release the door. The entrance on the rear platform and exit from front and rear platforms should be at least 23 in. in the clear. There should be no bulkhead doors, and the entrance and exit through the bulkhead, if separated, should each be at least 23 in. in the clear. Suitable grab-handles should be located on the vestibule corner post at the front exit and on the body post at the rear exit, with a pipe stanchion from step to hood on the rear platform separating the entrance and exit.

## FARE COLLECTION

"The conductor should be located on the rear platform behind a suitable separating rail or steadying device.

## SEATS

"Cross seats should be 34 in. long and longitudinal seats 36 in. A 28-ft. car with sixteen cross and four longitudinal seats will seat forty passengers. The seats should be 18 in. above the floor and 16½ in. wide, with a slope of 1½ in. for cross seats and 1 in. for longitudinal seats. The height of backs should be 18 in. and 14 in. respectively, and the slope of backs 4 in. and 3 in. Spring rattan properly shaped should be used for both seats and backs. Cross seats should be spaced approximately 30 in. from center to center.

"The standing room in this car, allowing 4 sq. ft. of aisle and platform space per passenger, will accommodate thirty-six passengers, making a total capacity of seventy-six.

"For the use of standing passengers there should be provided grab-handles or hand-holds on the backs of each cross seat and the usual hand-rail straps.

## WINDOWS

"Full opening should be given to vestibule windows. Monitors should be fixed shut and there should be provided sufficient roof or monitor automatic ventilators.

## HEATING

"There should be installed sixteen heaters of a total rated capacity of 12 amp.

## LIGHTING

"Twenty 16-cp incandescent lamps should be used, of which fifteen would be inside of car, one on each platform, two for destination signs and one for headlight. The interior lights should be arranged in single sockets, five on the ceiling and five on each side of the lower deck.

## CONDUCTOR'S SIGNALS

"There should be a push button on each side post with electric bell or buzzer on platform.

## BRAKING

"Both air and hand brakes should be used, together with mechanical sander.

## FENDERS AND WHEEL GUARDS

"Projecting fenders should be used only on cars operating on high-speed lines. Automatic wheel guards should be installed on all cars.

## DRAWBARS AND BUMPER GUARDS

"It is recommended that, if practicable, a fixed flush drawhead with movable drawbar be used, otherwise a drawbar of the telescoping type. No projection of any device beyond the bumper should be permitted and dash shields should be used, thus preventing 'hanging on.'

## RECOMMENDED CHANGES IN PAY-WITHIN CARS

## SIGNS

"It is recommended that the same system and type of illuminated car signs be used as for the new standard car.

## DOORS

"A simple mechanical passenger's release for sliding platform doors should be installed for use in emergency. This should be under the proper restriction of the car operatives.

## SEATS

"Eight cross seats removed from cars in their reconstruction as pay-within cars should be replaced and located either all on one side or four on one side and four on the other, diagonally opposite, at the same time widening the inside of the car alongside of the cross seats by removing the side linings between posts if feasible. These cross seats, together with the use of a more comfortable, higher, spring rattan back for the longitudinal seats and proper sloping of longitudinal seats and backs, will much improve the comfort of these cars. This arrangement will give satisfactory standing room for thirty-four and a total car capacity of seventy-four.

## VENTILATION

"An approved type of automatic roof or monitor ventilator should be installed.

## HEATING

"There should be added eight electric heaters of total capacity of 6 amp, giving a total of sixteen heaters with a rated capacity of 12 amp, thus doubling the heating capacity.

## LIGHTING

"Twenty 16-cp incandescent lights should be used with the same arrangement as recommended for the standard car. This is twice the present illumination.

## BRAKING

"A mechanical sander should be installed.

## FENDERS AND WHEEL GUARDS

"Automatic wheel guards should be installed and projecting fenders used only on high-speed lines.

## DRAWBARS

"The same type of drawhead and drawbar should be used as recommended for the standard car.

## RECOMMENDED CHANGES IN OTHER SURFACE CARS

"All surface cars should be equipped with mechanical sanders, automatic wheel guards and non-projecting drawheads as recommended for standard car. Projecting fenders should be used only on high-speed lines. All cars should be put

through the paint shop and thereafter painted and varnished on a definite schedule.

#### RECOMMENDED CHANGES IN SUBWAY-ELEVATED CARS

"The present subway-elevated cars are of satisfactory design and no changes in them are recommended. In the purchase of future cars, however, a few suggestions have been made above as to improvements of details."

#### INVESTMENT REQUIRED FOR ADDITIONAL EQUIPMENT

The report says that the plan outlined, based on the recommended service required for October, 1910, would involve the purchase of 489 large cars. These cars, if motor cars, with equivalent additional capacity of power house and feeder system carhouses and shops, would cost approximately \$15,000 per car for 465 "operating" cars and \$6,300 per car for twenty-four "shop" cars, or would involve a total expenditure of about \$7,126,000. The investment would be less if the general use of trailers in Philadelphia should prove to be practicable. The recommended changes in the present surface-car equipment would involve an expenditure not to exceed \$500,000.

The report recommends the purchase of twelve additional elevated-subway cars besides the 120 now owned. These cars would cost \$12,000 per car.

The report estimates that 100 additional cars per year with power and storage capacity will be needed by the system to provide for additional traffic.

### PAPERS PRESENTED BEFORE THE PACIFIC CLAIM AGENTS' ASSOCIATION

As noted on page 967 of the *ELECTRIC RAILWAY JOURNAL* for June 3, the third annual convention of the Pacific Claim Agents' Association was held in Seattle, Wash., May 19-20. The following are abstracts of the several papers presented at this meeting:

#### STEAM RAILROAD MEMBERSHIP

A. M. Lee, district claim agent Northern Pacific Railway, Seattle, Wash., pointed out the desirability of having the far Western steam railroads become members of the association. At the present time the association represented 75 per cent of the electric and steam railroads on the Pacific coast. Mr. Lee advocated that additional membership should be secured by personal solicitation wherever possible. No company on the Pacific coast could afford to be without membership in the Pacific Association even if it was a member of one of the national claim agents' associations. Many of the local companies were already members of either the steam or electric national bodies and fully recognized the good work which the latter were doing. The principal reason for the existence of a local association was that the claim agents on the Pacific coast are so far away from the center of the country that it was very difficult for them to meet the great body of claim agents at the frequent intervals necessary to insure valuable cooperation. Mr. Lee said that while there was some difference in the claim work of the steam and electric lines, it was not sufficient to interfere with a helpful exchange of ideas. Their interests were often identical, as they were obliged to fight the same class of litigants. Cordial relations between the claim departments of all the lines on the Pacific coast would benefit the railways to an extent vastly beyond the nominal cost of membership and would supply to the members individually in their line of business an asset of good friends not available in any other way.

#### INDEX INFORMATION BUREAU

E. H. Odell, claim agent Tacoma Railway & Power Company, Tacoma, Wash., presented a paper entitled "Is an Index Information Bureau a Necessary Adjunct to the Claim Department?" The underlying idea which justified the existence of a bureau of information for claim departments was protection from fraud on account of fictitious claims. From sad experience the claim agents of the Pacific coast had found that their territory was permeated with a large number of accident

fakers, who frequently changed their names and their territory of operation. In fact, in this territory, the percentage of gross earnings paid out for claims was larger than in any other part of the United States. It was essential, therefore, that claim agents should co-operate to disseminate and absorb information. If an association was beneficial in exchanging useful data once a year, surely a bureau of information to which all companies could have access every day in the year could be made 365 times as useful as an association. The association should establish such a bureau within itself, but it should be more than an index bureau. He had always made it a point in warning other claim agents about a fictitious claimant not only to give the name, but also the manner of operation used, and wherever possible a photograph was forwarded so that the culprit would be recognized even if he did change his name. An efficient index bureau could be maintained at very little cost. One salaried person in the office of the secretary-treasurer of the association, with the use of a typewriter, record book, index card and photograph apparatus, could do all the central office work necessary for sending out information. The members of the association would be expected to send in from day to day descriptions of such claimants as they believed to be frauds and as they thought were likely to go elsewhere to repeat their tricks. Mimeographed copies of these descriptions and reprints of the photographs would be made at the central office and mailed to each member of the association for future reference. Mr. Odell also discussed the advisability of using the services of the Hooper-Holmes Information Bureau of New York, as suggested by H. V. Drown, president American Electric Railway Claim Agents' Association. He feared, however, that this bureau would be of little value to subscribers so far away as the Pacific coast. In the adjustment of claims time was often the essence of the contract. Quick settlement was usually the most satisfactory. Much valuable time might be wasted in waiting to register claimants in New York and depending upon the uncertain receipt of important information before taking definite action. For this reason he was in favor of a local bureau for the use of claim agents on the Pacific coast.

#### PREVENTION OF ACCIDENTS BY CLAIM AGENTS

George Carson, claim agent Seattle Electric Company, presented a paper entitled "Prevention of Accidents by Claim Agents." The duty of the claim agent was not limited simply to the adjustment of claims arising out of accidents. It was his further duty to prevent accidents. A claim agent ought to study carefully and to observe the details of every accident on his railway to enable him to suggest some means for preventing repetition. When an accident report indicates a defect in the roadbed, the way department should be informed and the same procedure should apply to the rolling stock and other departments. In communicating this information and any suggestions the claim agent should exercise tact, fairness and firmness. Mr. Carson's practice was to make a daily report of all accidents which had occurred during the previous twenty-four hours and send it to the district manager, general counsel and superintendent of transportation. These reports showed the character and cause of the accident and were written so as to enable the responsible department to take immediate steps to remove the cause of the trouble. Thus one alighting accident was due to poor pavement and another accident was due to a guy wire which interfered with the proper operation of the trolley pole. Further to advise the responsible department of the character and location of the accident, Mr. Carson submitted a daily report showing the accidents for the previous twenty-four hours upon the different divisions. This enabled the proper authorities by daily comparison to see the increase or decrease in the number and kind of accidents upon the different lines. He also submitted a monthly report which showed the increase or decrease of various types of accidents upon the different divisions.

In order that direct influence might be brought to bear upon the employees and inspectors in charge of the different car lines, it was his practice to visit one of the six carhouses

weekly, which meant repeating the visit every six weeks. He was always accompanied by his investigators, the head of the transportation department and other officers of the company. One meeting was held in the evening and another during the day, so that no employees would miss the instruction. The program usually covered a discussion by each investigator of some particular subject, such as the sounding of gongs in the passing of a car, the handling of intoxicated passengers and the preparation of accident reports. The discussion on these subjects had proved of value to both the investigators and the platform men. This work could be made even more valuable if some reasonable allowance was made to the platform men for the time they were required to attend these meetings. It was very desirable also that the talks on accidents should be carried on at periodic intervals to prevent the men from losing interest in the subject.

The other way by which the claim agent could help to prevent accidents was by educating the public. This was a much more difficult task. The claim agent probably would not receive much credit for this work, because his motives would be considered purely selfish. Nevertheless, while the problem of reaching the public was difficult, it was not impossible. During the past school year, since September, 1910, his company had attempted to arouse the public to exercise more care by giving a series of direct talks to the children in the public schools. In Seattle there were about 900 public schoolrooms, 1000 teachers and 30,000 pupils. In addition there were in the private schools 50 teachers and 1500 pupils. Two talks had been given to all of these pupils between Sept. 10, 1910, and April 14, 1911. This meant reaching almost every person in the city, because the children naturally spoke at home about these lectures. To determine the probable effect of these talks along the line of safety, Mr. Carson made a comparison of his office records covering accidents to boys and girls injured through no fault of their own. Between July 1, 1909, and July 1, 1910, there were 157 accidents, or approximately thirteen per month. From Sept. 1, 1910, to May 1, 1911, a period of eight months covering the lecture period, there were thirty-three accidents, or approximately four per month, nine less per month than during the previous period. While the lectures in the public schools were not responsible for all of this reduction they constituted the principal factor. In addition to the lectures the following warning cards were distributed:

---

STREET CAR DON'TS FOR SCHOOL CHILDREN

*Don't* play on the car track.  
*Don't* hang on behind the car.  
*Don't* stand on the car steps.  
*Don't* touch a wire; it may be a live one.  
*Don't* put your head or arms out of the car window.  
*Don't* dart across the track in front of an approaching car.  
*Don't* cross immediately behind a passing car. There might be another car or vehicle approaching close in opposite direction.

*Stop!*

*Don't* jump on or off a moving car.

*Look!*

*Don't* take any chances.

*Listen!*

---

Mr. Carson believed that one reason why these talks would prove of permanent value was that the minds of children were much more susceptible to new impressions than those of adults. In conclusion, he said that the courts could also help materially in the reduction of accidents if they were to hold that no one who got off or on a moving car could recover damages. Out of a mistaken sense of kindness the courts had really done the public an injury by allowing too small a degree of care to sustain a recovery.

Mr. Carson's paper was discussed by Mr. Odell, who said that instead of commencing his campaign of education through the schools, as had been done in Portland and Seattle, his first endeavor had been to reach the owners and drivers of vehicles. The proprietors of transfer companies and the owners of wagons employed in delivering express matter were his first pupils. About four years ago he had found, by classifying the accidents reported by his trainmen, that 70 per cent of all collisions were with delivery wagons of all kinds. Many of these collisions appeared to be altogether avoidable. On look-

ing into the matter he found a warfare going on between the motormen and teamsters. The drivers were contending with the motormen for the right of way on the street and were purposely blockading the tracks. The union to which they belonged was so strong that in almost every case the blame for the collision was placed on the motorman. In consequence, the railway had to pay large amounts for repairs to damaged vehicles and even for the deaths of valuable horses. To minimize, if not to prevent, this expense Mr. Odell arranged meetings of the principal employers of teamsters at which methods and measures to obviate these difficulties were discussed. He learned that the owners of teams were as much averse to their property being damaged as were the officers of the railway company. Even if they were reimbursed for the direct damage they were not compensated for the time lost and for the ensuing inconveniences and annoyances. Mr. Odell persuaded them to post notices in their transfer barns warning the drivers against certain accidents which might result from carelessness and explaining how such accidents might be prevented. Many employers also posted a notice to the effect that if a collision occurred between one of their wagons and a street car the driver of the team would be discharged. Within six months after the first conference street-car collisions with wagons diminished 33⅓ per cent and within a year more than 50 per cent.

In Tacoma there were many grades, so that it was almost impossible for teams to stand up, let alone to haul heavy loads in icy weather. The railway, therefore, instructed the motormen to favor the drivers as much as possible when bad weather conditions prevailed. Now, instead of continual warfare between the teamsters and motormen, there was a strong feeling of reciprocity which had resulted in great savings to the street railway and the team owners. Whenever a collision with a truck is reported Mr. Odell and the vehicle owner communicate by telephone at once. He and the owner would then review the statements of all the witnesses, to decide where the responsibility belonged and to take their medicine. He rarely had trouble in adjusting these cases. In the near future he intended to call a meeting at the Tacoma Commercial Club of all the taxicab owners to bring about an understanding whereby taxicabs paralleling street-railway tracks will keep clear of the tracks in foggy weather. The Tacoma company had also given accident instruction lectures in the public schools along the lines explained by Mr. Carson. Much good had resulted therefrom. Persistency, however, was necessary to obtain permanent benefit. The public was prone to forget and it was likely that a lesson learned to-day would not be heeded to-morrow.

REDUCING BOARDING AND ALIGHTING ACCIDENTS

J. N. Hone, claim agent Spokane & Inland Empire Railway, read a paper on "How to Diminish Boarding and Alighting Accidents." This end could be achieved by education alone. His company had started with the 20,000 school children in Spokane. They had become so interested in the subject that he was able to show to the delegates some fifty or sixty essays on accident prevention from all grades in the schools. Many accidents could be prevented if the services of women's clubs and the various lodge and church organizations were enlisted. The claim agent should ask himself this question: "Am I doing all that is within my power to prevent accidents?" Last winter in order to secure the lively interest of the Spokane public he had published an article in the newspapers stating that his company would offer a prize of a \$5 book of car tickets to every fiftieth woman and a \$5 gold piece to every one hundredth woman who got off a street car correctly at certain important corners. While only two \$5 gold pieces and two books of tickets were given away, the amount of advertising from this scheme could hardly be estimated. Many people informed him that they had never before realized how few women got off cars the right way. Mr. Hone then described at length the accident talks to employees as developed by E. F. Schneider, general manager of the Cleveland, Southwestern & Columbus Railway. Mr. Hone felt that the officials of many electric railways did not

always get into close enough touch with their platform men. The men should be taken into the confidence of the management, taught how to prevent accidents and be made to feel that each one is an essential and valuable part of the system.

#### ORGANIZATION OF A MEDICAL DEPARTMENT

T. A. Cole, claim agent Los Angeles Railway, presented some notes entitled "Organizing a Large Medical Department for a Large Street Railway." The first thing to be considered was the selection of a chief surgeon with ample assistance. The whole department should be on friendly terms with local physicians. The duties of the medical department should begin prior to the accident itself—that is, with the examination of the platform men, because it was very important that eyes and ears should always be on the alert. The claim and operating departments should be closely related with the medical department. The latter should have a staff so large that some member would always be available to respond to the first call for aid and to endeavor to minimize the injury as much as possible, thereby easing the way for the claim agent. The representative of the medical department should tell the injured person that if the railway is at fault he will be treated fairly. In case the company was sued the doctor should be prepared to render aid to the claim and legal departments. The medical department's reports, however, should not be such as to mislead the claim agent, who must be governed by them to a great extent. The chief surgeon of the medical department of the Los Angeles Railway is appointed by the general manager. He has full charge of his department and employs his own assistants. Every employee of the company is entitled to medical or surgical treatment, in return for which the company collects 50 cents every month for the fund of the medical department.

#### SETTLING PHYSICIANS' BILLS.

J. H. Handlon, claim agent United Railways of San Francisco, discussed the subject whether it was advisable to hold out the amount of the physician's bill in making settlements and pay the physician direct. Claim agents should not adhere to a fixed policy in handling these bills for services rendered to claimants in personal injury claims. Usually the best plan was to leave the matter of payment in the hands of the claimant, because when the claim agent endeavored to withhold the amount of the bill in order to pay it directly to the doctor the claimant's antagonism might be aroused. He would naturally assume that his honesty was questioned and might become so angry as to withdraw from the settlement. It was very undesirable to stir up such feeling, as the aggrieved person would spread a prejudiced report among all his friends and acquaintances. However, some effort should be made to comply with the wishes of physicians when they request that the claim agent pay them directly for their services. Of course, this should apply only to cases where the doctor has acted honorably throughout the entire transaction and co-operated in every reasonable way with the company to effect a settlement. The good will of the physician was far more important than the good will of the injured person. Once the claim had been settled there was little likelihood that the claimant would have any future dealings with the company, whereas the physician might have many cases where his continued good will would be of great value to the company.

There are three electric railways in Christiania, Norway, owned by private companies. They were formerly owned and managed by the city. The combined mileage of the three lines is 28.1 miles, and the fare 2.68 cents for adults and 1.34 cents for children under twelve years. Transfers are given free of charge on different branches of two of the lines, while a transfer from one line to another costs 1.34 cents additional. Laborers are carried at half fare at certain hours in the morning. The roads hold their franchises under concessions from the city, which expire in 1924, and as consideration they have to pay the city 10 per cent per annum of all receipts from the passenger traffic. Merchandise is not carried except bundles and hand baggage.

## RECEIVERS FOR METROPOLITAN STREET RAILWAY, KANSAS CITY

Receivers were appointed for the Metropolitan Street Railway, Kansas City, Mo., on June 3, 1911, on the application of Alexander New, attorney for the Kansas City Railway & Light Company. The receivers are R. J. Dunham, Chicago, Ill., chairman of the board of directors of the Kansas City Railway & Light Company, and Ford F. Harvey, Kansas City, head of the Fred Harvey System. The appointments were made by Judge W. C. Hook, of the United States Circuit Court, at Kansas City, Mo. Mr. Dunham made the following statement:

"The street railway franchises expire in 1925. More than \$18,000,000 of obligations to creditors mature in September, 1912, and May, 1913. At that time these obligations must be met or refunded upon a short-time franchise. The annual gross street railway earnings are in excess of \$6,000,000. These, if the property be kept together, ought to be ample to meet expenses, maintenance and interest, as well as to accumulate a surplus for these creditors.

"The growth of Kansas City has been phenomenal, both in population and territorial limits, thus requiring much additional service and many new lines, so that, in addition to franchise requirements, the public demands extensive improvements and many additions to the property. Creditors having debts which mature within a year or two are not willing that the earnings should be used for this purpose instead of being applied upon the indebtedness. Therefore, to meet this situation it is necessary to borrow new money. To obtain this security must be given. Such improvements, if made, would fall under the lien of present mortgages which cover existing and after-acquired property. Investors will not lend new money for the improvements unless they can have a first lien upon that which their money creates. With such lien the money can be obtained. To obtain it requires some kind of a new contract with the city.

"More than \$13,000,000 of the bonds were issued prior to the peace agreement of 1902, under franchises expiring in 1925. These bonds are secured by mortgages upon different lines in the down-town districts and heart of the city. These bondholders claim they are not bound by the provisions of the present ordinances as to transfers, extensions or the payment of 8 per cent of the gross earnings. Such a controversy precipitated would threaten and, if maintained, would force a dismemberment of the system. Other bondholders, general creditors, stockholders and the public, particularly the latter, are alike interested in preventing this.

"In order to keep the property together and render that service which the public desires, a receivership became inevitable, much as it is regretted. It is hoped that the court will be able soon to return the property to the stockholders, for in the meantime efforts will be made to adjust all differences between bondholders and refund all obligations, even upon the short remaining franchise period.

"It is possible that out of the situation some arrangement may be made with the city whereby there can at an early date be obtained the new money for all necessary improvements and additions.

"Before outlining any definite policy for the receivership I must confer with my co-receiver, Mr. Harvey, who, I understand, is out of the city. Until that time Mr. Egan will continue as general manager of the street railways and all employees will continue in their positions, subject to his orders and directions as heretofore.

"The proceedings in no way affect the Kansas City Railway & Light Company, but are in the interest of its creditors; nor do they affect the Kansas City Electric Light Company or the Kansas City Heating Company, the securities of which are held by the railway and light company. The earnings of the latter are much in excess of the sums necessary to meet the interest upon all the obligations of all the companies, and it is expected that all interest on the securities will be met and paid when it becomes due."



John M. Egan, president of the Metropolitan Street Railway, will remain in charge of the operation of the road. He issued the following statement:

"Regarding the action taken this day, Mr. Dunham's statement covers the entire ground. Until the receivers meet and outline the policy to be pursued I will operate the road as heretofore, giving the best service possible. The present rules and regulations pertaining to the operation and maintenance of the system will be enforced."

Mr. New said, briefly, that the main purpose of the receivership was to protect the property from being segregated by the bondholders whose interests are in one part of the lines and also to protect the public.

Frank Hagerman, vice-president of the company, said that the receivership would keep the property intact and continue the universal transfer system, which would be destroyed if the creditors of the various lines that were under different ownership prior to 1901 should take possession of the properties. Ultimately extensions will be made and the public will gain as a result of the receivership.

The company represented to the court that "the property of the Metropolitan Street Railway will, if its interests be preserved and the system maintained as a whole, be sufficient to meet all its mortgage bonds, its note indebtedness pledged as aforesaid, pay its general creditors and net a result upon account of its stock." On the other hand, the company asserted "if the Metropolitan Street Railway should be dismembered, or if it should not be operated as a whole, or if the demands secured by the said mortgages or deeds of trust upon its property or the unsecured claims of its general creditors should be separately asserted and enforced, then there will be such sacrifice that all the creditors will not be paid in full and the stockholders will receive nothing."

Negotiations for a new franchise for the Metropolitan Street Railway were begun early in 1909. An ordinance was drawn and submitted to the West traffic way committee of Kansas City in June, 1909, as a basis for negotiations, and was subsequently modified by the sub-committee of the West traffic way committee and submitted to the entire committee. When the franchise came before the Council for consideration it was amended by that body and submitted to the voters of Kansas City on Dec. 16, 1909, for approval. The ordinance was defeated at the referendum election. A digest of the principal provisions of the franchise ordinance which was submitted to the voters was published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 11, 1909, page 1199.

The questions of the improvements to be made by the Metropolitan Street Railway in Kansas City and of financing the needed extensions were referred to at length in the *ELECTRIC RAILWAY JOURNAL* of March 18, 1911, page 472, and March 25, 1911, page 530.

### REPORT ON WHITE CEDAR

Secretary H. H. McKinney, of the Northwestern Cedar-men's Association, with headquarters at Minneapolis, Minn., has made a report showing conditions governing the present supply of white cedar products and a forecast of the conditions for the remainder of 1911. He says, in part, that at the present time the seasoned stocks of all lengths of poles and posts are unusually low and that dealers are facing a steadily increasing demand for stock with a much smaller source of supply than at this time a year ago. With an increase of consumption of 10 per cent in 1911 over 1910, stocks of all sizes from 7-ft. posts up will practically be wiped out before another logging season is finished. Statistics show that on Jan. 1, 1910, there were about 875,000 more poles from 16 ft. in length up than on Jan. 1 of this year, and the production for the past winter has easily been 20 per cent below the estimate, thus reducing greatly the seasoned stocks on hand. The estimated consumption of white cedar poles from 16 ft. up for 1911 is 2,452,187.

### BRIEF OF COMPANY IN MILWAUKEE LOW-FARE CASE

The brief of the Milwaukee Electric Railway & Light Company in the case in which the city of Milwaukee seeks to have a lower fare established has been filed with the railroad commission of Wisconsin. The brief bears the names of Miller, Mack & Fairchild, attorneys, and of Sullivan & Cromwell, counsel for the company.

It is contended that the complainant failed entirely to establish its case. The brief states that if a high rate of profit by a railway should arise from excessive rates, there would be proper reason for public complaint, but if the rates are reasonable when measured by the service rendered, the amount of the profits will depend upon the efficiency of the managers and their ability in being able to operate with a small rather than with a large investment. In a history of the property particular emphasis is laid on the advantages of the consolidation of various properties which was effected at the time of electrification. The opinion of John I. Beggs is quoted to the effect that the consolidation doubled the value of the property, and on the greater economy and efficiency that it made possible, and that it was easier to operate a consolidated property and earn a return on it upon double the capitalization than it would have been to take the separate constituent properties and attempt to earn a return upon them on half the amount. Emphasis is also laid upon the advantages which the city derives from the consolidation.

In regard to the basis of return, the brief states that the record in the case fully justifies the adoption of the capitalization of the company as a basis for computation. The bonds and capital stock were issued under the laws of the State. The franchises were granted with knowledge of capitalization and the capitalization was recognized in the dealings with the city. Further it is stated that the capitalization represents only a fair compensation for the property, including the service of the organizers. It is stated that the capitalization is approximately the same as the actual cost of the railroad on a cash basis, including cash discount, plus the actual cost of making a railway a going concern, but exclusive of any interest on that cost, and that the capitalization is only slightly above the appraisal of the physical property, plus the cost of bond discount and the principal and interest of making the road a going concern. Decisions are quoted to show that the railroad commission of Wisconsin has laid down the doctrine that the actual total investment is, as a general rule, a proper basis on which the return is to be computed. It is stated that when the city granted the franchise for electric traction it involved a recognition on the part of the city that properties suitable for electric traction should be substituted for the horse railway equipment, which had proved unsuitable for that purpose. The existing horse railway equipment was not to be thrown away without compensation.

Taking up the subject of value of the property, the argument says that there is a good reason for not giving consideration to the so-called depreciated value, because the consumer is interested in the mechanism which furnishes the service, and that service, assuming that the plant be kept in good repair, is the same whether the plant is one year old or twelve years old. To give an appraisal of cost of reproduction new any importance as a guide, it must include, the brief says, all the elements that were included in the original railway. In this respect most appraisals have failed. The common form of reproduction value now ignores many elements, such as the work of planning and experimentation in building up the enterprise. The increase of efficiency through a co-ordinated, harmoniously operated whole is appraised by Mr. Beggs generally as increasing the value of the property 20 per cent. The loss of interest during the early years of operation, while the company has obtained some earnings but not sufficient to pay any return on the investment, is the same in principle as the loss of interest during the period of construction when there are no earnings. The sacrifice of interest in both cases is part of the cost of establishing the property.

In the future, if the company is permitted to work its own way out, the benefits of the combination will be retained, but an increase in operating expenses is to be expected as to almost every item involved. Coal, lumber and practically every other item used in operation is increasing in price. Additional burdens are being imposed by statutes or municipal ordinances. Another item of expense that will accrue in the future is license fee. The expense will also be increased by greater liability for injuries and damages, as a result of statutory changes in the law. The company has also in contemplation a plan for a relief fund for the employees and also a system of profit sharing. These will be added burdens to the expense account and are not compatible with reduced earnings. So far as depreciation reserve is concerned, the company, the brief says, should be encouraged to act liberally rather than parsimoniously. Adequate reserves are necessary, not only to furnish means for the purchase of the best and most efficient apparatus, but also for quicker replacements of deteriorated property. Inadequacy is a danger as great as, and perhaps greater than, obsolescence. Efficient operation requires a margin of safety. It is argued that, so far, the company has never had sufficient earnings to be able actually to make a sufficient depreciation reserve and that its present depreciation reserve is inadequate to manage even the existing depreciation of its present physical property.

The dividends actually paid average only 4.06 per cent on both the preferred and common stock for the ten years from 1897. The limited return of the company has postponed capital expenditures for shops and carhouses. Concerning the proper rate of return, the brief says that some reserve for success and good management is necessary, if capital is to be obtained for utility companies. A public utility has the added hazard that it is in the public eye and is subject to exceptional legislative interference.

Another difficulty encountered is the amortization of the franchise. So far, the company has been able to make no provision whatever for the amortization reserve, and its earnings ought to be sufficient to allow it to compensate itself in the remaining years of the franchise. Litigation about rates and service is one of the dangers peculiar to the public calling. The company has already been involved, the brief says, in two wholly unnecessary proceedings regarding its rates. Another burden peculiar to the public service corporation is the continual necessity of increasing the capital. The statement of Mr. Beggs that earnings of from 8 per cent to 12 per cent are necessary to induce capital to enter into street railway enterprises is, the brief says, conservative to the maximum; less than 12 per cent would tend to discourage investors in the enterprise. Such a return would not necessarily involve the distribution of the entire earnings to the stockholders annually. A margin of safety should be provided for losses or unexpected changes in value or poorer business. A larger return should be allowed to the company that is well managed and furnishes good service than to a poorly managed company. Another principle which it is proper to enforce is to permit the company to increase its rate of return with any reduction in its rate of charge.

The only opportunity which the company can have to retrieve the years of loss and of meager profits will be through the possibility of increased earnings from the present time to the expiration of its franchise in 1934. The company sets up in its answer the allegation that any reduction of fares will involve confiscation of the property and will be an impairment to the contract embodied in its franchise, in violation of the constitution of the United States.

Attorney-General Lightfoot of Texas will investigate the books and affairs of the Western Union Telegraph Company, the Postal Telegraph-Cable Company, the Bell Telephone Company, the Southwestern Telegraph & Telephone Company, the Western Electric Company, the General Electric Company, the United States Electric Company of New Jersey and its branches in Texas; also of the Stone & Webster Management Association, of Boston, which operates several public utility corporations in Texas.

## HEARING IN REGARD TO INTERPRETATION OF NEW JERSEY LAW

A public hearing was held at the court house in Newark, N. J., recently by the Board of Public Utility Commissioners of New Jersey, principally to hear argument on the question of the interpretation of that section of the new public utility act which forbids "public officials" to accept free transportation from the public service corporations. The Public Service Railway was represented by Frank Bergen, general counsel; the Morris County Traction Company by E. A. Archer, general manager, and the Atlantic City & Shore Railroad and the Central Passenger Railway, Atlantic City, N. J., by J. N. Akarman, general manager.

Mr. Bergen said that the Public Service Railway discontinued the free transportation extended to policemen, firemen and other public officers on the strength of the opinion expressed by him that the law made such practice illegal. It was his opinion that the law applied to all municipalities whether or not they had contracts with street railways for the free transportation of public officials. Mr. Bergen said:

"Those who have been contending that this act does not affect such contracts between municipalities and utility corporations are forgetting that in making these contracts the municipalities were acting merely as the agents of the State and that the State could abrogate those contracts at any time. For that reason I believe that all these agreements are abrogated by this statute.

"We extend the courtesy of this free transportation in practically all the municipalities in which we operate, although we have received no very hearty thanks for it so far as I know. No doubt we would have continued it gladly if it had not been for this law. All that we stand for is that those who have passed the law to forbid the continuance of this privilege should take the consequences and not we. When the court decides the question we shall abide by the decision. But we do not want the company criticised for somebody else's mistake."

Mr. Archer said that the Morris County Traction Company was under contract to furnish free transportation and that it had not discontinued transporting free the public officers designated in its franchise. He expressed a desire to continue to meet the terms of the ordinance under which his company operates.

Mr. Akarman said that the companies which he represented were under contract to carry city officers free. He desired to have the conditions under the old act continue in force. He believed that the board could construe the act so as to permit the company to comply with an obligation which it felt in duty bound to perform.

The representatives of municipalities who were present all contended, in short, that policemen, firemen and members of health departments are employees, and not "public officials."

Charles M. Egan, assemblyman of Hudson County, represented the State Firemen's Association. The new law was the outcome of Mr. Egan's original bill. He said that neither he nor any others of those who were instrumental in the passage of the measure expected that it would affect the firemen and policemen. He said he believed public policy demanded that these officers should be carried free. He called attention to that section of the act which permits the board to fix classifications and to approve contracts, and he thought the board might very well use its power to allow municipalities to contract with public utilities corporations for the free transportation of such officers.

President Williams, of the board, asked that briefs covering the claims set up, and especially covering the question of the interpretation of the term "public official" and also on the matter of the influence of the new law on existing contracts between municipalities and public utilities corporations be submitted to the board.

On June 3, 1911, the board announced its decision as follows in regard to the question of the free transportation of "public officials":

"The board does not regard the free transportation, without discrimination, on behalf of a municipality, of policemen, firemen and inspectors of boards of health in the performance of their public duties as a violation of the provisions of public laws, 1911, Chapter 195."

The board, under date of May 26, 1911, issued the following memorandum in regard to certain published statements made in connection with the offering for sale of public utility securities issued under the laws of New Jersey:

"The attention of the Board of Public Utility Commissioners has been directed to certain published statements made in connection with the offering for sale of certain public utility securities issued under the laws of this State. These statements are so worded as to be capable of misleading the public, and particularly possible investors, by including the belief that this commission confirms or has confirmed the financial and business standing of issuing corporations as a whole, by approving the issue of certain securities by such corporations. As regards the approval of security issues, the statute charges the commission with the duty 'after hearing, to approve of any such proposed issue maturing in more than one year from the date thereof, when satisfied that the same is to be made in accordance with law and the purpose of such issue be approved by said board.' (Laws of 1911, Chapter 195, Section III.) Such approval, when granted, must not be interpreted as implying more or less than the law specifically requires. Nor does such approval by this board of such proposed issues of securities carry or imply any confirmation of the business or financial standing of the issuing corporation as a whole. All persons who utter, issue, circulate or publish any statement to the contrary will be held to strict accountability for the same."

The board is sending to every public utility in the State a copy of the new law, accompanying it with a circular calling particular attention to certain features of the act. One of the things to which attention is directed is the provision requiring the approval by the board of any grants or privileges to public utilities by municipalities, and also the approval by the board of any issues of stocks or bonds by a public utility, or of any sales, leases, mortgages and transfers of stock by one public utility to another. Attention is also directed to the fact that agents, experts or examiners of the board are empowered to enter upon any premises occupied by any public utility, for the purposes set forth in the act. All such agents will be supplied with proper means of identification by the board.

### DIVISION OF FIVE-CENT FARE IN NEW YORK STATE

The following figures on the division of the electric railway nickel were compiled by Curran & Mead, New York, for the Street Railway Association of the State of New York from the reports of all street railway companies in New York State to the Public Service Commission of the First and Second Districts. These figures are based on reports for the year ended June 30, 1909.

	Amount.	Per Cent of Operating Revenues.	Distribution of Five Cent Fares. Cents.
Maintenance of way and structures.....	\$6,386,781	.0678	0.3390
Maintenance of equipment.....	7,584,483	.0805	0.4025
Cost of power.....	10,628,601	.1128	0.5640
Other transportation and traffic expenses.....	4,726,506	.0502	0.2510
Conductors and motormen.....	18,228,989	.1935	0.9675
General expenses, including insurance, etc.....	3,814,462	.0405	0.2025
Damages and legal expenses.....	4,831,360	.0513	0.2565
Taxes.....	5,168,278	.0548	0.2740
Rentals.....	756,873	.0080	0.0400
Interest.....	25,052,358	.2659	1.3295
	\$87,178,691		
Surplus.....	7,022,975	.0747	0.3735
	\$94,201,666	1.0000	5.000

The table shows that little over one-third of 1 cent has been left as a surplus for each 5-cent piece when the different costs quoted have been met.

### PAPERS READ AT NATIONAL ELECTRIC LIGHT ASSOCIATION CONVENTION

Abstracts of several papers and committee reports presented at the convention of the National Electric Light Association were printed in the *ELECTRIC RAILWAY JOURNAL* of June 3. At the session of the convention on Friday, June 2, two other papers of interest to electric railway officers were read.

#### FUEL OIL FOR STEAM BOILERS

Herbert A. Wagner, Baltimore, described the system employed by the Consolidated Gas, Electric Light & Power Company in its Westport station for using coal and oil simultaneously for fuel for its boilers. The space under the boiler back of the usual coal grate is made into a large combustion chamber with the oil burners at the extreme rear end. This chamber is separated from the boiler tubes above it by tiling and from the coal grate by a low bridge wall. The coal grates are 14 ft. wide and 8 ft. long. Each furnace is provided with four oil burners. Oil is delivered to the boilers under 20 lb. of pressure per square inch and is atomized in each boiler by means of a steam jet.

Under actual operating conditions the maximum boiler outputs obtained during seven-hour runs have been as follows: With coal used alone, 1188 hp; with oil alone, 702 hp; with coal and oil together, 1445 hp. It was found that a 2000-kw station load could be carried by each boiler when using coal and oil together with as much ease and certainty as 1200 kw per boiler could be carried when coal is used alone. The results indicate a gain in output of 66 2/3 per cent by the use of the oil or a saving of 40 per cent in the cost of the boiler equipment for a given output.

The cost of oil for producing a certain amount of steam is about 33 per cent more than that of coal. In spite of this difference in cost of fuel, the actual cost of banking is less with oil than with coal for the reason that the oil is burned efficiently while the coal is necessarily burned very inefficiently. The author stated that a saving in investment and in labor for peak load was effected by the use of oil. Fuel oil shows its advantages as compared with coal most markedly when used as fuel for operating steam plants in connection with long transmission lines receiving energy from hydro-electric stations.

The paper contained considerable data relating to the use of fuel oil as compared with coal. From this data it was shown that the cost per month for fuel and labor for boilers to keep 10,000 kw in reserve at full steam pressure and ready to take the load equals \$1,600 with oil and \$3,126 with coal.

#### SCIENTIFIC MANAGEMENT

L. B. Webster, Marion, Ind., gave the results of a scientific study of the labor performed in the power house and in overhead line construction. A considerable portion of a boiler fireman's time is spent in work which, while necessary, puts no coal on the fire. Much of the time, however, he is idle. A careful record was taken of the working terms of eighteen firemen working in three shifts under the most severe load conditions while the boilers were being worked at from 100 per cent to 150 per cent of their rated capacity. Each man fired 600 hp of boilers using the poorest grade of unscreened anthracite. Notwithstanding the overload on the boilers and the poor grade of fuel, the eighteen firemen spent only 47 1/2 per cent of the total time working and were idle 52 1/2 per cent of the time. Such details as the style and number of fire doors caused a variation of from 25 per cent to 30 per cent in the working time of two firemen on the same shift and firing boilers of the same horse-power.

Experiments made to determine the saving in coal and labor effected by forcing a boiler showed that when steaming at 135 per cent of the rated capacity as compared with 80 per cent capacity the water evaporated per pound of coal fired increased from 6.14 lb. to 6.92 lb. When steaming at 118 per cent of capacity as compared with 80 per cent the amount of coal fired per hour increased 60 per cent while the ratio

or working time to total time of the fireman increased from 34.1 per cent to 42.7 per cent. Thus an increase of 60 per cent in the amount of coal fired was made with an increase of only 25 per cent in the working time of the fireman, which still remained less than one-half of the total time of the shift.

Similar observations were made in the engine room. An engineer was found to spend 32 per cent of the time doing his own work, 11 per cent doing the work of low-priced oilers and 57 per cent of the time he was idle. An oiler was observed to spend 37 per cent of his time working and to be idle 63 per cent of the time. Investigation showed that the efficiency of the labor in the plant under observation was equal to, or higher than, that in other plants of the same size. The problem of reducing labor costs in the engine room is to convert that portion of the time which is spent in waiting for something to happen into useful time in which work of real value is being performed.

### REPORT OF INDIANA RAILROAD COMMISSION ON SIGNALS DELAYED

The special committee which was to have reported to the Indiana Railroad Commission on June 1, 1911, the results of its investigation of block signal systems proposed for installation on the interurban electric railways of Indiana made a verbal report through A. W. Brady, its chairman, to the effect that progress is being made and asked for more time to consider the merits of the systems installed on several roads for experimental purposes. Chairman Wood, of the commission, said that inasmuch as the adoption of any system or systems would involve large expenditures by the interurban railways the commission felt that the managers should have reasonable time to agree on the merits of the systems proposed and granted the committee until June 23, 1911, to make its final report.

### THE LETTER BALLOT ON STANDARDS

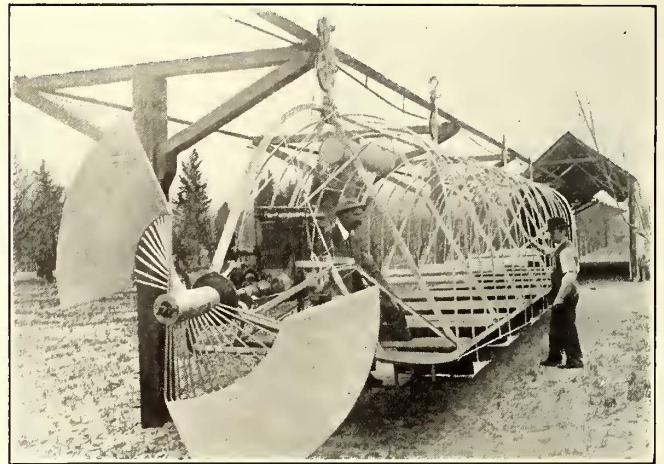
Member companies of the American Electric Railway Association should not overlook the fact that their opinion has been requested by the Engineering Association on the formal adoption of the proposed engineering standards. A plea was published in this paper last week to the members of the association to reply to the request of the committee on city rules of the Transportation & Traffic Association, so that the committee should be guided by the wishes of the association in drafting a standard code of city rules. The letter ballot on the subject of engineering standards is equally important to the members of that association. Under the procedure of the Engineering Association these standards have been considered carefully by the association and by the committee on standards and now need only formal adoption of the association by letter ballot to become actual standards. In behalf of the engineers who have worked on the revision of these standards a full expression of opinion is requested.

### LARGE ORDER FOR POWER CABLES

A short note was published in this paper last week in regard to an order for cables recently placed by the Boston (Mass.) Elevated Railway through the Stone & Webster Engineering Corporation, Boston, Mass., with the American Steel & Wire Company, Worcester, Mass. This order is said to be the largest ever placed for underground cables. It covers about 67 miles of No. 0000 three-conductor, paper-insulated, lead-incased cables for 14,000 volts working pressure. These cables are to be installed by the manufacturer and are to be used in connection with the new Boston Elevated power station at South Boston, which is being erected for the Boston Elevated Railway by the Stone & Webster Engineering Corporation. The manufacture of this order calls for about 700,000 lb. of copper, over 165 tons of manila paper and nearly 2,000,000 lb. of lead, and it will require 125 or more cars to transport the finished cables.

### AERIAL MONORAILWAY

An aerial monorailway has been projected between Glendale, a suburb of Los Angeles, and Burbank, Cal., a distance of 12 miles. The inventor, J. W. Fawkes, has built an experimental car, and a piece of track 600 ft. long near Burbank and a circular track 1 mile long are being built to test the car at high speeds. The accompanying engraving from a photograph shows the car and its propeller-driving mechanism. The car is built almost entirely of aluminum and seats fifty-six persons. It is supported from the overhead track by four hangers the sheaves of which run on the top edge of the track. At one end is mounted a large two-blade aluminum propeller which is direct-

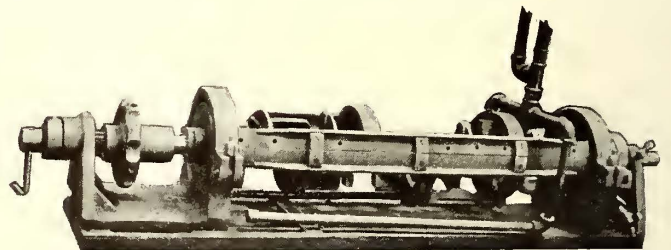


Aerial Car

driven by a four-cylinder, 20-hp gasoline engine. While the engine of the experimental car has been run at only 200 r.p.m. the inventor believes that a speed of 100 m.p.h. is possible with propellers mounted at both ends of the car and revolved at 1600 r.p.m. A company with a capital of \$100,000 has been incorporated in California to promote the construction of lines and to build the cars.

### REHEATER FOR SPEED-ROLL INSULATOR

The electrical shop of the Chicago Railways Company repairs and reinsulates the speed rolls of old controllers. A special reheating device has been made to use in setting speed-roll insulation. An illustration of the device is shown. This reheater consists of a cast-iron frame shaped to receive the speed-roll shaft with its sections slipped over it. After the



Reheater for Speed-Roll Insulator

insulation has been inserted a well-distributed gas flame is applied until the insulating compound becomes softened. Then by means of a screw hook at the end of the shaft a collar of the same section as the insulating material is driven against this material to force it into place while all parts of the speed roll are held in their correct positions by the cast-iron framework. This reinsulation of a speed roll requires about one hour. It has been done on more than one-half of the controllers for the 328 cars now being rebuilt in these shops.

A proposal has been made to connect the tramway systems of Johannesburg and Pretoria, South Africa.

## NEW LIGHTING TRANSFORMERS

In the new line of lighting transformers which the Allis-Chalmers Company is now placing on the market three cooling surfaces are provided instead of the single surface in the ordinary plain case transformer. This is accomplished by encircling the main case with a jacket and providing for the circulation of oil between the two. Both the tank and the jacket are made of boiler plate. They are connected at top and bottom by short tubes, leaving an air space between the two. All joints are welded, making both the tank and jacket seamless, and absolutely preventing the chance of leakage. In addition to the three radiating surfaces provided, the space between the jacket and the tank forms a flue which causes currents of air to ascend at a considerable velocity, thereby exerting a scrubbing action on the surface which greatly facilitates heat dissipation. This style of tank is used on all lighting transformers of from 20 kva to 50 kva capacity inclusive. The tubes connecting the top and bottom of the tank and jacket provide for a continuous and positive circulation of the oil.

A departure has also been made in the 40-kva and 50-kva sizes by so arranging the coils that there is a ventilating space between them to allow free circulation of the oil. These sizes are wound with two low-voltage and one high-voltage coil, the latter being placed between the other two. The coils are separated from each other and the space between them provides ventilating ducts on each side of the high-voltage coil through which the oil can readily circulate. All of these transformers are supplied with taps which enable normal secondary voltage to be secured, even if the voltage supplied the primary coil is 5 per cent or 10 per cent below normal. These transformers are designed for use on 2200-volt or 1100-volt lines. The use of the taps makes it possible to step down from 2200 volts in nine different ratios and from 1100 volts in six different ratios, thus providing considerable flexibility.

## ◆◆◆ SPOKE TYPE STEEL WHEELS

The Lobdell Car Wheel Company, Wilmington, Del., has been making steel wheels several years with such success that during the past year it has enlarged its plant to meet the increased demand. This steel wheel is of the spoke type, giving the maximum strength for weight of metal used. It is said to be considerably lighter than any other form of steel wheel for the same service. This wheel can be made with a thick tread and turned down several times when necessary; or it can be made with the same thickness of tread as a chilled iron wheel for use as a one-mileage wheel as conditions may warrant. The flange and tread are made exceedingly hard to insure unusually long wear.

This company has made wheels extensively for the Philadelphia Rapid Transit Company, the Capital Traction Company of Washington, D. C.; the Wilmington & Philadelphia Traction Company, the Cincinnati Traction Company, the Washington & Virginia Railway Company and others. It still manufactures chilled-iron wheels, having a daily capacity of over 600 wheels of this kind.

## DOUBLE-TRUCK CITY CARS FOR BOISE & INTERURBAN RAILWAY

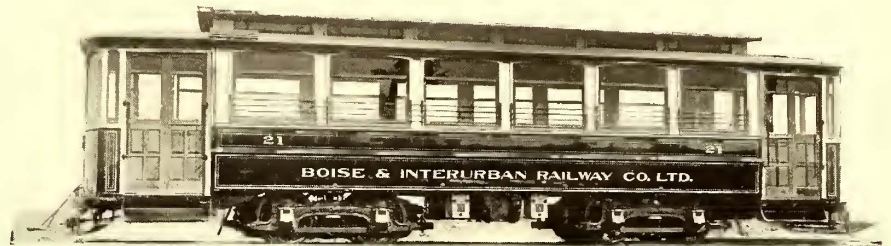
The Boise & Interurban Railway Limited, Boise, Idaho, has purchased from the St. Louis Car Company two cars of the type shown in the accompanying illustration. These cars are of the double-end, concave and convex panel type and have six extra large windows per side. The length over the body is 28 ft., over the vestibules 40 ft., over the bumpers 41 ft. The width over the sills is 7 ft. 10 in., and over the posts 8 ft. 3 in.

The bottom framing of each car consists of 4-in. x 7 $\frac{3}{4}$ -in. side sills of long leaf Southern yellow pine. The end sills are of oak. There are four cross sills of oak. Between the side sills and sub-sills there is a steel plate  $\frac{1}{8}$  in. x 11 in. for the full length of the car body. The flooring is of long-leaf yellow pine. Under the cross seats there are two layers of flooring with felt paper between. Maple strips are used in the aisle. All posts and longitudinal rails are of white ash. The roof is of the monitor type well braced with six carlines extending across the entire roof and securely fastened to plates. The roof is covered with No. 8 cotton duck. The platform drop from the car body is 9 in. The platforms, which are 6 ft. long, are supported by oak knees. The outside knees are plated with 3-in. x 8-in. plates with 3 $\frac{1}{2}$ -in. x 7-in. x  $\frac{1}{2}$ -in. angles. The center of the platform is supported by 4-in. x 4-in. x  $\frac{1}{2}$ -in. angles extending through the bolster.

The vestibules have three single drop sash. Each vestibule opening is provided with double folding doors, having a single glass in each door. These doors are so arranged as to be easily removed for replacement by gates. The St. Louis Car Company's standard channel folding gates are furnished with



Lighting Transformer



Double-Truck Car for Boise, Idaho

these cars. All moldings, the mahogany sash and doors are finished in natural color. The design is very plain and is known as "sanitary." All trimmings are of nickel-plated solid bronze. The ceilings are of three-ply mahogany veneer.

The body doors are of the double automatic sliding type. There are two sash to each window opening, the upper being stationary and the lower dropping into a pocket flush with the arm rail. This pocket is covered with a hinged cap. Each car contains eight reversible cross-seats and two longitudinal seats per side, giving seating capacity for forty passengers.

Among the specialties on these cars are Knutson trolley retrievers, Pantasote curtains, St. Louis Car Company's radiating spring drawbars, vertical brake wheel, fenders and illuminated signs. The cars are further equipped with electric heaters, Westinghouse straight air-brake equipments and No. 101-B motors which are mounted on St. Louis No. 47 trucks.

◆◆◆  
Among the fenders which have recently been tested by the St. Louis Board of Public Improvements is one designed to stop the car in case the fender should strike a person on the track. The fender is the invention of R. S. Mills, of St. Louis. A circuit-breaker is controlled by a solenoid carried on the fender or wheel guard and when the fender or wheel guard is tripped the main circuit of the car is opened, the brakes are applied and the rail is sanded. There is also an emergency switch on the platform by which the motorman can accomplish these three results simultaneously if he sees the object before it strikes the fender.

## OUTING CAR OF THE DETROIT UNITED RAILWAY

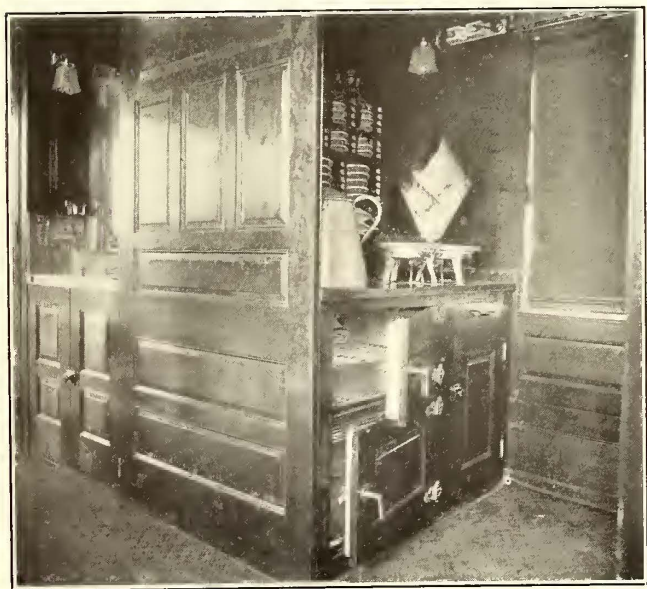
The outing car "Yolande" of the Detroit United Railway has recently been rebuilt by that company at its Monroe Avenue shops under the direction of Sylvester Potter, master mechanic. The rebuilt car contains many interesting features which were designed by F. W. Brooks, general manager. The "Yolande" is available for hire over any of the company's lines by the hour or day and is always in charge of the same crew. The



Observation and Dining Section of Detroit Outing Car

colored conductor waits at table and in general is at the command of those who engage the car. Although in commission for little over a month the "Yolande" is proving popular as an unusual way of entertaining guests. In fact, A. D. B. Van Zandt, publicity agent of the company, states that it has already been booked for more than half the summer.

As shown in the two accompanying halftone illustrations, the "Yolande" is arranged for preparing and serving meals



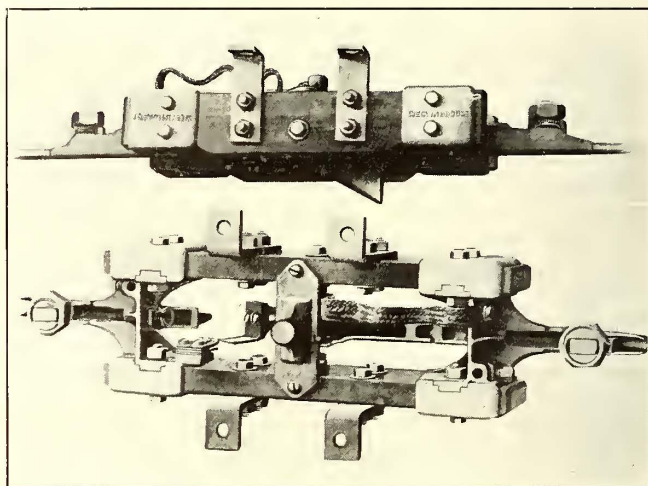
Kitchenette of Detroit Outing Car

en route. It is equipped with hot and cold water, two electric stoves, a kitchenette with a full equipment of utensils and monogrammed tableware and linen. A flush toilet is also provided. Wicker lounging chairs are provided on one side of the car and tables with leather upholstered chairs on the other side. Campstools are also supplied. The car will seat fifty people without the tables and about thirty people when a combination

of chairs and tables is used. The car, which is single-ended, is 51 ft. 3 $\frac{3}{8}$  in. long over the bumpers and 40 ft. 5 in. long over the body. The width over all is 8 ft. 11 in. and the width inside 7 ft. 8 in. The height from track to roof is 13 ft. 2 $\frac{1}{2}$  in. The rear platform is 5 ft. 5 in. long. Two Brill No. 27 trucks of 6 ft. wheelbase carry the body. The operating equipment consists of four Westinghouse No. 56 motors, one K-14 controller, air brakes and Peacock hand brake. The car is heated by electricity.

## AUTOMATIC SECTION INSULATORS

The Westinghouse Electric & Manufacturing Company has recently placed upon the market a new type of automatic section insulator similar to its type K. B. section insulator except that a circuit opening and closing arrangement is incorporated in the automatic type. Side bars of impregnated hickory take the tensile stress due to the trolley wires. All metal parts are of either sherardized malleable iron or of a bronze composition. A wedge of the type that has given excellent service on standard trolley frogs is used to secure the trolley wire in each approach. Supplementing the wedge an internally threaded chuck is provided. This, when tapped into its tapered hole, firmly grips the wire. The opening and closing of the circuit is effected by a switch blade, mounted on



Side and Top View of Automatic Line Breaker

a rocker. In one position of the rocker the blade makes connection with spring contactors, and in the other position contact is not made. The action of a spring prevents the rocker from remaining in an intermediate position.

Current is fed to the rocker switch blade through a heavy, flexible, woven-copper bond, which is securely connected at each of its ends. When the trolley wheel is inbound no arc can be drawn across the knife switch and contact because their connection is completed before the trolley wheel leaves the rocker, which is always energized. In returning the trolley does not open the branch line until the wheel has passed onto the rocker.

## CHARCOAL CONES FOR GROUNDING

Among the electrical specialties of the Paragon Sellers Company, Chicago, Ill., is the Paragon ground cone, which can be applied for grounding the lightning arresters of railway signal installations, transformer secondaries and telegraph, telephone, power and transmission lines. This article is a hollow cone which is made of pure copper filled with charcoal. The cone is perforated with seventy-five holes to the square inch. The charcoal attracts the moisture and the perforations give the desired ample number of discharge points. The cones are installed simply by dropping them into post holes which are bored for the purpose.

# News of Electric Railways

## Meeting of the Central Electric Railway Association

The program for the meeting of the Central Electric Railway Association which is to be held in St. Joseph, Mich., on June 22, 1911, is in preparation. The headquarters of the association for the meeting will be at the Edgewater Club. As the accommodations at the Edgewater Club are limited, it is suggested that reservations for rooms should be made at the Hotel Whitcomb, which is across the bridge from the Edgewater Club.

## Meeting of Central Electric Accounting Conference

The next meeting of the Central Electric Accounting Conference will be held in Springfield, Ill., on Saturday, June 24, 1911. Henry J. Davies, secretary and treasurer of the Cleveland Railway, will address the conference on the subject "Legislation Affecting Electric Railway Accountants." After adjournment the members will go by special train to St. Louis, where they will be the guests of the Illinois Traction System. The official program of the meeting is now being prepared.

## The Master Car Builders' and Master Mechanics' Conventions

The American Railway Master Mechanics' Association will hold its forty-fourth annual convention at Atlantic City, N. J., June 14, 15 and 16, and the forty-fifth annual convention of the Master Car Builders' Association will be held at the same place on June 19, 20 and 21. The exhibits will be placed on Young's Million-Dollar Pier and all the sessions of the two conventions will be held in the Greek Temple on the pier. The sessions each day will be from 9:30 a. m. to 1:30 p. m. Cards for registration will be furnished at the enrolment booth at the entrance to the pier.

The program of the Master Mechanics' convention contains only one committee report which is of general interest to electric railway officers. It is on flange lubrication. The Master Car Builders' Association will have reports on brakeshoes, couplers and draft gear, car wheels, lumber specifications and safety appliances.

## Philadelphia Rapid Transit Company's Refinancing Plan Formally Ratified

E. T. Stotesbury, of Drexel & Company, Philadelphia, Pa., through whom funds have been provided for the rehabilitation of the physical property of the Philadelphia (Pa.) Rapid Transit Company, was formally elected a director of the company on June 6, 1911. The associates elected to the board with Mr. Stotesbury are Thomas E. Mitten, president of the Chicago (Ill.) City Railway; Charles E. Ingersoll, a director of the Pennsylvania Railroad; C. S. W. Packard, president of the Pennsylvania Company for Insurances on Lives and Granting Annuities, and Horatio G. Lord, of Drexel & Company. The directors who retired from the board are Charles O. Kruger, P. A. B. Widener, George D. Widener, John B. Parsons and August B. Loeb. The new directors, Messrs. Stotesbury, Mitten, Ingersoll, Packard and Lloyd, constitute the new executive committee, of which Mr. Stotesbury is chairman. Mr. Stotesbury was also elected chairman of the board of directors. During Mr. Stotesbury's absence abroad Mr. Mitten will act as chairman of the board. The board of directors of the company as now constituted follows: E. T. Stotesbury, Horatio G. Lloyd, C. S. W. Packard, Charles E. Ingersoll, Thomas E. Mitten, W. H. Sheldermine, J. J. Sullivan, William H. Carpenter, Mayor Reyburn, of Philadelphia, and John S. Phipps. In 1910 George H. Earle, Jr., resigned from the board of directors of the company as a representative of the city, and a successor to him to serve the city on the board with W. H. Carpenter and Mayor Reyburn remains to be elected. The voting trust, composed of Rudolph Ellis, Arthur E. Newbold and George H. McFadden, organized on Feb. 20, 1911, was formally authorized at the meeting. The stockholders of the Phila-

delphia Rapid Transit Company and the Union Traction Company also authorized the \$10,000,000 loan. At the conclusion of the meeting the following official statement was issued:

"Mr. Stotesbury's associates are in full accord with his expressed desire and intention, which is to rehabilitate the physical property of the company and improve its operating methods to the end of developing the best street car service which it is within the financial ability of the Philadelphia Rapid Transit Company to produce, and which he is assured by Mr. Mitten can, within the next five years, be made at least equal to that enjoyed by any other American city. The new capital represented by the \$10,000,000 bond issue now authorized is a very small amount with which to attempt to accomplish such a material change in conditions, and it can only by the exercise of the utmost care be made sufficient to complete the rehabilitation of the present property.

"To insure the proper maintenance and renewal of the property an amount equal to 15 per cent of the gross earnings will be used for that purpose. It is estimated that the expenses of the company, including the aforementioned maintenance and renewals, will be approximately \$1,500,000 in excess of its earnings during the three years ensuing, to meet which deficit the company now has salable securities remaining from the old fire insurance fund. The securities when sold will produce approximately this sum. The remaining two years of the five-year period, it is thought, will result in a small earned surplus, which should continue to grow larger each year thereafter.

"Mr. Mitten's estimate is not based upon a reduced cost of operation, as all of the economies effected will be offset by the larger number of seats necessary to be supplied to the public during the rush hours and the increased wage of one-half cent per hour, approximating \$100,000 per annum, which the company is now under published promise to give to its motormen and conductors on July 1 of each year.

"Mr. Stotesbury has assumed this gigantic task with the limited funds at the company's disposal solely in the hope that the result of his efforts may be of great and lasting benefit to Philadelphia. Under these circumstances Mr. Stotesbury's task becomes a public undertaking, and one in which he now asks and should properly receive the good word and co-operation of the press, the public and the company's employees, as with this assistance only can the result desired by all be most quickly and satisfactorily accomplished. While it is estimated that the greater part of the five-year period will be consumed in bringing the traction system up to the desired degree of efficiency, such improvements as are now possible will be undertaken as rapidly as circumstances will permit.

"New cars can be added only as rapidly as the additional power necessary to their operation can be provided, the experience of the last winter having demonstrated that the company's supply of power is not sufficient to meet snow-storm requirements even with that number of cars which are now in regular operation. Power to be effectively used should be supplied from the company's Delaware Avenue power house, which it is proposed to enlarge. Before any additional power can be produced therefrom, however, the excavations and piling for the foundations must be completed, which, with the time necessary afterward to install the power-producing units, will require from twelve to fifteen months, making no relief possible from this source until the latter part of next year. In the hope of adding at least 200 new cars against the maximum demand of the coming winter, efforts are now being made to purchase a temporary supplying power. The company's Delaware Avenue power house will meanwhile be rapidly pushed to completion.

"Rerouting of car lines will be given careful consideration, and the report of Ford, Bacon & Davis to the State Railroad Commission [Published in part elsewhere in this issue—Eds.] will no doubt be of great assistance. The actual rerouting of cars should not, however, be undertaken in haste, for the reason that the routes of many of the car lines, as now operated, have been in existence for a great many years; the lines

of travel upon them have become established, so that any system of rerouting which would disturb these existing conditions must be given very careful study before any change is made.

"The wages of motormen and conductors are set forth in the company's published notice of April 5, 1910, which provides for a maximum wage of 23 cents per hour for year beginning July 1, 1910; 23½ cents per hour for year beginning July 1, 1911; 24 cents per hour for year beginning July 1, 1912; 24½ cents per hour for year beginning July 1, 1913; 25 cents per hour for year beginning July 1, 1914.

"In addition to the foregoing, an amount of \$500 is paid to the surviving relatives at the death of any motorman or conductor who has been more than two years in the service of the company. Those employees who are more than sixty-five years of age, and who have been in the service twenty-five years, receive a pension of \$20 per month during the remainder of their lives. Twenty-two per cent of the gross earnings, or 22 cents out of every dollar taken in on the company's cars, is now required to pay the present scale of wages. If more than 22 per cent of the gross earnings were to be used for this purpose, the physical property could not be adequately maintained, for the reason that the \$1,500,000 now set aside to meet the deficit of the next three years would then be insufficient for that purpose. The sufficiency of 22 per cent of the gross earnings here used as compared in amount with that used in the most favored American cities in this regard has been given careful consideration.

"Twenty-five per cent of the gross earnings, or 25 cents out of every dollar taken in on the company's cars, is believed to be the largest amount paid by any company in wages to its motormen and conductors in any city of the Middle or Eastern States, and in these cities the average fare, including transfers, approximates only 3 cents per passenger. The 22 per cent of the gross earnings, or 22 cents out of every dollar taken in on the company's cars, now paid in Philadelphia to motormen and conductors is greater per passenger carried than the 25 per cent paid in these other cities, for the reason that the rate of fare in Philadelphia, including transfers, is slightly in excess of 4 cents per passenger; in other words, the motormen and conductors of this company receive more wages per passenger carried than do the motormen and conductors in any of the cities aforementioned.

"The introduction of larger cars and better operating methods, together with proper co-operation between the men and the management, will very materially improve the operating efficiency of the company so that it may compare favorably with that of any of the cities aforementioned, thereby making possible such an increased scale of wages during the intervening years as should result in a maximum wage of 28 cents in the year commencing July 1, 1915, or the fifth year of the Stotesbury management.

"This added increase in wages of motormen and conductors over that promised in the company's published notice of April 5, 1910, must of a necessity depend upon the degree of co-operation displayed by the men in assisting the management in its efforts to improve the methods of operation. Such an increase of wage would necessarily be deferred and perhaps made impossible should the company be put to expense on account of labor trouble with its motormen and conductors, as in that event the costs incident thereto would have to be spread over the remainder of the five-year period and paid out of the 22 per cent of the gross earnings set aside for wages of motormen and conductors, thus consuming the money which would otherwise be available for the purpose of increased wages.

"Summarizing the situation, it can be now well stated that the affairs of the Philadelphia Rapid Transit Company are in the hands of a public-spirited citizen, Mr. Stotesbury, who, actuated by a desire to perform a real service to his native city, is now attempting, with the limited resources at the company's command and with its very heavy expenses as compared with its earnings, to build up a perfect system of transportation and at the same time satisfy the three parties in interest. To the public he promises an adequate system of transportation within a five-year period, but counsels patience during the accomplishment of this object; to the motormen and conductors he promises recognition of their efforts in the way of co-operation by such wages as

the resulting increased efficiency makes possible, but to the stockholders of the Philadelphia Rapid Transit Company he can only promise the building up of their property to the end that it may be a credit to its owners and productive of return upon the \$30,000,000 of capital actually paid in. There can be no hope of dividend upon this stock, however, until good service to the public has become an established fact and the wages of the motormen and conductors have been placed upon a satisfactory basis."

The statement made by Mr. Mitten, which shows the disposition of the fund for rehabilitation which is now available, was published in the *ELECTRIC RAILWAY JOURNAL* of April 15, 1911, page 682.

### Three-Cent Fares in Cleveland

On June 1, 1911, the Cleveland (Ohio) Railway discontinued the charge of 1 cent each for transfers and began the operation of the lines on a straight 3-cent fare within the city limits. This was done in compliance with a notice from G. M. Dahl, street railway commissioner, to the effect that the interest fund had reached \$700,000, or \$200,000 more than the required \$500,000, and that under the Taylor ordinance the fare must be reduced to 3 cents. On the evening of May 29 the City Council adopted a resolution which sustained Mr. Dahl.

The directors of the company met on May 31, 1911, and decided to put the 3-cent fare into effect, but it was stated that something must be done to provide sufficient funds to take care of the business of the company in the future. J. J. Stanley, president of the company, issued the following statement after the meeting:

"On last Monday evening the Council adopted a resolution directing the Cleveland Railway to reduce the fare to 3 cents cash fare, 1 cent for transfer, and 1 cent rebate, commencing on June 1. The directors met Wednesday morning and directed that the fare be so reduced. They have done this notwithstanding that they regard it as poor business policy in the face of the maintenance reserve showing a shortage of \$264,000 and the operating expense showing a shortage of \$121,000, making an actual shortage of \$385,000 instead of any surplus whatever.

"Last June the company applied for an increase of its operating allowance. This request was renewed last January, and was granted by Council recently, to be effective from May 1 and continuing until Jan. 1. It is hoped that the operating deficit will substantially be made good before Jan. 1, 1912. If not, the company will again apply for an increase in the operating allowance.

"As to the \$264,000 shortage in the maintenance and renewal reserve, it may be necessary in the near future to apply for an increase. This should be granted by the Council without any application in order to comply with the principles of good business management, as the board is unable to see the wisdom of directing a reduction of fare at the same time that the shortage in the maintenance and renewal fund is increasing."

The board discussed the proposed amendments to the Taylor franchise, but came to no conclusions upon any of them. Mr. Dahl insists that the company shall not be granted an increase of its maintenance and renewal fund unless it applies to Council. He says that there should be no deficit and that the company should not have spent the money it did until the fund was sufficient to allow it.

At the meeting of the Council committee on street railways on the evening of June 1, 1911, a communication was received from City Solicitor Baker in which he criticised several of the proposed amendments to the Taylor franchise, as indicated in the Kramer ordinance, introduced some time ago. He expressed the fear that the 3-cent fare would be endangered, as well as the city's right to purchase the property, unless these conditions are further safeguarded. He says that no amendment should be adopted to give the suburbs the low fare, as they are admitted without a referendum vote. He also objects to the plan to have the city take over the property at the capital value, in case it is decided to purchase, on the ground that it is holding out temptation to inflate and increase the capital value as a means of discouraging municipal ownership.

Mr. Baker advises that the provision for the city to take over the property should be made specific as to that



portion lying within the city limits. Unless this is done doubt may arise as to the city's right to own and operate a railroad outside of its limits and the company could deny that the city has a right to purchase part of the property without taking it in its entirety. Mr. Baker insisted that no amendments should be passed until the company agreed to allow the city to name immediately a purchaser for the property.

Mr. Dahl charged Mr. Baker with being an obstructionist. He said that opponents of these amendments seem to consider 3-cent fare sacred. Judge Tayler, in framing the ordinance, did not have 3-cent fare in mind, but advocated allowing the people to ride at cost with a profit of 6 per cent to the stockholders of the company. According to Mr. Dahl, Mr. Baker knew that the company would not accept an amendment that would take the property out of its hands. Mr. Dahl also attacked Mr. Baker's opposition to extending the low fare to the suburbs as they are annexed, and said that he feared an attempt to annex all the suburbs in order to make an increase in the fare necessary.

D. C. Westenhaver, one of the attorneys for the late Mayor Tom. L. Johnson and a member of the special committee of the Chamber of Commerce which recommended a number of amendments, stated that no amendment should be adopted without providing for a referendum vote. Mr. Dahl answered that he was not opposed to a referendum vote, but that it was the duty of those who thought that such a vote should be taken to present a petition. If the City Council made provision for such a vote in adopting amendments, it would indicate a desire to shift the responsibility to the people. He said that he would not vote for a referendum, but that he would defend the amendments before the people, if a referendum is had on them.

Commissioner Dahl has requested the company to instruct conductors on the pay-within cars to keep the rear doors of these cars open at all times. This move has been made because of the accidents which have occurred in closing the doors on women's skirts and in other ways.

#### Transit Affairs in New York

The special committee of the Board of Estimate and Apportionment of New York and the Public Service Commission agreed on June 5, 1911, upon a policy and report on the subway problem. At a conference at the Bar Association the last details were discussed, and at the conclusion of the session President McAneny of the Borough of Manhattan said that an agreement had been reached and that he and Chairman Willcox of the Public Service Commission would have the report in shape for submission to the meeting of the Board of Estimate on June 8, 1911. The city's conferees agreed that nothing should be made public concerning the nature of their recommendations or the policy to be outlined until the report itself is presented.

Despite the fact that it was announced that the recommendations of the committee would not be made public in anticipation of the presentation of the formal reports, the daily papers on Tuesday and Wednesday all said that the report would recommend a division of territory between the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company. In brief, it was stated that the report of the transit committee would favor the building of two tunnels under the East River, one for each company, but would recommend the control of all the bridges by the Brooklyn Rapid Transit Company through the assigning of the Centre Street loop to that company. As for the location of the lines, the Brooklyn Rapid Transit Company, so it was stated, would get the loop north to Fifty-ninth Street and across the Queensboro Bridge to Queens and the Interborough Rapid Transit Company would get the Broadway-Lafayette Avenue loop through Brooklyn, connecting with Manhattan by a tunnel under the East River at Fourteenth Street. In detail it was predicted that the committee would report for the Brooklyn Rapid Transit Company in favor of the Pineapple Street tunnel under the East River, this to be extended under Broadway at Liberty Street to Church, there to afford a connection with the Hudson tunnels. From that point it is said that a route north is to be laid out for the Brooklyn Rapid Transit Company under Church Street to Vesey Street, through Vesey Street to Broadway, up

Broadway to Forty-second Street, and thence up Seventh Avenue to Fifty-ninth Street, there to turn eastward to cross the Queensboro Bridge into Queens. This, with the Centre Street loop, would represent the Brooklyn company's share in Manhattan. Along with this it was said that a 5-cent fare would be demanded from the Brooklyn Rapid Transit Company from Fifty-ninth Street to Coney Island. For the Interborough Rapid Transit Company such an arrangement would mean the Eastern Parkway subway in Brooklyn, together with the Broadway-Lafayette Avenue loop, to connect at North Seventh Street with the tunnel under the East River to Manhattan. Added to this would be the Lexington Avenue and Seventh Avenue routes in Manhattan as extensions to the present subway north and south of Forty-second Street.

Governor John A. Dix of New York issued the following statement on June 1, 1911, announcing the appointment of J. Sergeant Cram, chairman of the general committee of Tammany Hall, as a member of the Public Service Commission of the First District of New York to succeed Edward M. Bassett, whose term of office expired in February.

"I know Mr. Cram to be a man of unusual force and ability and of demonstrated courage and independence. He is a man who accomplishes results, the kind of man the New York City rapid transit situation needs at the present time. \*\*\*Another reason is that I desire to have on the First District Commission at least one member I personally know and who will be a part of my administration.\*\*\* I believe Mr. Cram understands as few men do the rapid transit needs of New York City; that he has complete knowledge of the details of the rapid transit problem and will treat the question from the viewpoint of the entire municipality.

On June 2, 1911, Borough President George McAneny of Manhattan, who is chairman of the transit committee of the Board of Estimate, which is to report on the subway offers, sent Governor Dix a letter protesting against the Governor's action in appointing Mr. Cram to succeed Mr. Bassett, at this time particularly. He suggested that the nomination of Mr. Cram be withdrawn, at least temporarily. Mr. McAneny, after calling the attention of the Governor to the present subway negotiations and their nearness to conclusion, suggested that the injection of a new personality would either delay the matter indefinitely or compel the appointee to vote on the basis of opinions he entertained before he became a member of the commission.

In reply to Mr. McAneny Governor Dix said that he had knowledge of the situation in New York before he nominated Mr. Cram, and that he believed the addition of Mr. Cram to the commission would result in prompt action so far as subway extensions are concerned.

Following the announcement of his appointment Mr. Cram in an interview declared himself in favor of constructing subways first, then of finding an operator for them, of a 5-cent fare to Coney Island, and of the use of Third Avenue instead of Lexington Avenue for the uptown east-side subway.

Mayor Gaynor on May 31, 1911, in a letter to a real estate operator in Brooklyn, criticised the Brooklyn Rapid Transit Company severely for supposed sins of omission. He criticised specifically the type of cars used and the fact that the company had not installed the underground conduit system.

T. S. Williams, president of the Brooklyn Rapid Transit Company, was prompt to reply to the Mayor. In a public statement he enumerated some of the indorsements his company has had from the Public Service Commission and its representatives relating particularly to the condition of the company's equipment and general property, its credit and financial standing, the value behind its securities and its bookkeeping methods. He also said that during the eight years ended June 30, 1910, the Brooklyn Rapid Transit system had expended \$12,658,000 for rolling stock, and during the last ten years had expended upward of \$12,400,000 in maintenance of equipment, making a total expenditure of upward of \$25,000,000 since 1900.

**Bureau of Public Utilities Proposed in Pittsburgh.**—An ordinance creating a city bureau of public utilities is being prepared by the City Solicitor and will be presented to the new Council of Nine, which has been appointed by Governor Tener.

# Financial and Corporate

## New York Stock and Money Markets

June 6, 1911.

Both trading and prices have been irregular during the week, but there have been only slight recessions from the new levels reached after the Supreme Court decisions. The bond market continues to exhibit strength. The increase in the volume of financing and the fact that money rates have become a trifle higher are regarded as signs of better conditions. Quotations to-day were: Call,  $2\frac{1}{4}$ @ $2\frac{1}{2}$  per cent; ninety days,  $2\frac{3}{4}$ @ $3$  per cent.

### Other Markets

The Philadelphia market has been spasmodic, with a firmer tone toward the latter part of the week. Slight advances were made to-day in the transit shares, with the trading marked by the strength of the Lehigh Valley Traction issues.

Fractional gains have been made in the majority of the Chicago elevated issues, and the market has been mildly active. About 9 per cent of the total stock of the various elevated companies, in accordance with the terms of purchase by the Blair syndicate, were deposited up to Monday noon with the Illinois Trust & Savings Bank.

Trading in Boston has been active. Massachusetts Electric common reached 24 and the preferred reached 93. To-day's market was irregular with minor price changes.

The Baltimore market is quiet, with a fair bond demand.

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

	May 29.	June 6.
American Light & Traction Company (common).....	a295	a295
American Light & Traction Company (preferred).....	a108	a107
American Railways Company.....	a44½	a44
Aurora, Elgin & Chicago Railroad (common).....	40	a41½
Aurora, Elgin & Chicago Railroad (preferred).....	86	a86
Boston Elevated Railway.....	a127½	128
Boston Suburban Electric Companies (common).....	a15	a14½
Boston Suburban Electric Companies (preferred).....	a75	a75
Boston & Worcester Electric Companies (common)...	a8½	a8½
Boston & Worcester Electric Companies (preferred)...	a50	a51
Brooklyn Rapid Transit Company.....	80	81¾
Brooklyn Rapid Transit Company, 1st ref. conv. 4s....	85½	86
Capital Traction Company, Washington.....	a130	130
Chicago City Railway.....	a195	a190
Chicago & Oak Park Elevated Railroad (common)...	2	2
Chicago & Oak Park Elevated Railroad (preferred)...	7	5
Chicago Railways, pteptg., ctf. 1.....	a82	a82
Chicago Railways, pteptg., ctf. 2.....	a22½	a23
Chicago Railways, pteptg., ctf. 3.....	a10	a10
Chicago Railways, pteptg., ctf. 4.....	a6	a6
Cincinnati Street Railway.....	a130½	a131
Cleveland Railway.....	98	a97½
Columbus Railway (common).....	a96	a96
Columbus Railway (preferred).....	a101	a101
Consolidated Traction of New Jersey.....	a77	a76
Consolidated Traction of N. J., 5 per cent bonds.....	a105½	a105½
Dayton Street Railway (common).....	a30	a30
Dayton Street Railway (preferred).....	a100	a100
Detroit United Railway.....	71¾	a74
General Electric Company.....	167½	163¾
Georgia Railway & Electric Company (common).....	136½	141
Georgia Railway & Electric Company (preferred).....	92	92
Interborough Metropolitan Company (common).....	18¾	19¾
Interborough Metropolitan Company (preferred).....	53	54
Interborough Metropolitan Company (4½s).....	79¾	79¾
Kansas City Railway & Light Company (common)....	a19	a19
Kansas City Railway & Light Company (preferred)...	a49	a49
Manhattan Railway.....	136¾	a140
Massachusetts Electric Companies (common).....	a21¾	a23¾
Massachusetts Electric Companies (preferred).....	a89½	a91
Metropolitan West Side, Chicago (common).....	a26	a26
Metropolitan West Side, Chicago (preferred).....	a72½	a72½
Metropolitan Street Railway, New York.....	15	*15
Milwaukee Electric Railway & Light (preferred)....	*110	*110
North American Company.....	75	76½
Northern Ohio Light & Traction Company.....	46	46
Northwestern Elevated Railroad (common).....	a27½	a28½
Northwestern Elevated Railroad (preferred).....	a69	a69
Philadelphia Company, Pittsburgh (common).....	57	58¾
Philadelphia Company, Pittsburgh (preferred).....	43½	44
Philadelphia Rapid Transit Company.....	17¾	19¾
Philadelphia Traction Company.....	82½	84
Public Service Corporation, 5% col. notes (1913)....	101	101
Public Service Corporation, cts.....	a107	a107
Seattle Electric Company (common).....	a109½	a110
Seattle Electric Company (preferred).....	a101	a103½
South Side Elevated Railroad (Chicago).....	a77½	a77½
Third Avenue Railroad, New York.....	*12¾	11¾
Toledo Railways & Light Company.....	7¼	a8
Twin City Rapid Transit, Minneapolis (common)....	a110	110
Union Traction Company, Philadelphia.....	a48	49¾
United Rys. & Electric Company, Baltimore.....	a18¼	18¼
United Rys. Inv. Co. (common).....	41½	42
United Rys. Inv. Co. (preferred).....	*72	71½
Washington Ry. & Electric Company (common)....	a34	34
Washington Ry. & Electric Company (preferred)....	a89¾	89¾
West End Street Railway, Boston (common).....	a90½	a90¾
West End Street Railway, Boston (preferred).....	a103½	a103½
Westinghouse Elec. & Mfg. Co.....	78½	77
Westinghouse Elec. & Mfg. Co. (1st pref.).....	118	118¾

\* Asked. \*Last sale.

**Another Hearing in Chicago on Subway Plans.**—At the meeting of the transportation committee of the City Council of Chicago, Ill., on May 31, 1911, the plan for subways proposed by R. C. St. John, formerly assistant subway engineer under Bion J. Arnold, was considered. An outline of this plan was published in the ELECTRIC RAILWAY JOURNAL of May 27, 1911, page 922.

**Report on Improvements of Pennsylvania Railroad at Philadelphia.**—The accounts published in the newspapers of Philadelphia on June 7, 1911, which purport to give the essentials of the recommendations which are to be made to the Pennsylvania Railroad by the board which is considering the question of terminal improvements in Philadelphia, are declared by the company not to be authoritative. The report by the board is now being prepared and it is expected that it will be presented at an early date.

**New York Railway Held to Be a Nuisance.**—The Appellate Division of the Supreme Court of New York has reversed a judgment of the Special Term which sustained the demurrer of G. H. Montague, receiver of the Fulton Street Railroad, and dismissed the city's complaint. The suit was brought to have the Fulton Street Railroad's franchise forfeited. The Appellate Division said that on that point of the complaint the demurrer was properly sustained because the action could be brought only by the people acting through the Attorney-General. The court, however, said that an examination of the complaint showed that the action was one to enjoin the maintenance of a nuisance. The court further said: "The worn and defective rails in the streets constitute the nuisance complained of, and an adjudication that they are a nuisance coupled with some provisions for their removal will in no way involve an adjudication forfeiting the franchise for non-user. \* \* \* An adjudication requiring the removal of the rails would still leave the owners of the franchise free to replace the old rails with new and operate the railroad."

## LEGISLATION AFFECTING ELECTRIC RAILWAYS CONNECTICUT

Two reports have been prepared for presentation to the Connecticut General Assembly by the judiciary committee, to which the public utilities matter was referred. A majority report, signed by seven of the eleven members of the committee, was in favor of a commission to have charge of all the public service corporations in the State, except the railroads and electric railways, these to remain under the jurisdiction of the present railroad commission. A minority report, signed by the other four, provided for a single commission of three members to have charge of all public utilities. The minority bill is after the form of the State Business Men's Association bill, which Governor Baldwin refused to indorse. It provides powers as to rates, service and capitalization. The reports were to be submitted to the Senate on June 6, 1911.

## MASSACHUSETTS

The bill of the Boston & Eastern Electric Railroad, seeking a certificate of public convenience and necessity to authorize it to proceed with construction, reached a third reading in the House during the week ended June 3, 1911. Representative Washburn, Worcester, opposed passing a bill with a penalty clause. The proposed amendment striking out the penalty clauses was lost, and third reading ordered on a voice vote which was practically unanimous. The committee on street railways has reported adversely on the recommitted House Bill No. 522, which provides that scholars' tickets shall be subject to the same penalties for abuse which exist in connection with transfer tickets issued to passengers. A special report has been sent to the Legislature in response to an order requesting the Railroad Commission to determine means to be employed to protect passengers from injury at stations of the Boston Elevated Railway (House 1953). The committee on ways and means has reported in favor of a resolve providing for an investigation of improvements in the subway and transportation system of Boston. The committee on street railways has reported leave to withdraw House Bill 1164, to provide for the issuance of free transfers for the night patrons of the Boston Elevated Railway.

ANNUAL REPORT

United Railways Investment Company

The statement for the year 1910 of this company from its investments in San Francisco, Pittsburgh and elsewhere shows the following:

Income:	
Dividends on stocks owned.....	\$2,044,672
Interest on bonds owned.....	3,000
Interest on loans and accounts receivable.....	60,189
Interest on bank balances.....	1,700
Total .....	\$2,109,561
Expenses and other charges:	
Expenses:	
Salaries .....	\$30,556
Legal .....	17,000
Corporation taxes .....	5,570
Transfer agents', registrars' and trustees' fees.....	3,625
Fees of trust companies for paying coupons, etc.....	1,077
Tax on increase of capital stock.....	1,200
Tax on bonds held in Pennsylvania.....	877
Directors' fees and expenses.....	2,237
Stationery, printing and postage.....	1,284
Traveling .....	3,053
General .....	8,544
Total .....	\$75,023
Other charges:	
Interest on collateral trust sinking fund 5 per cent gold bonds .....	\$907,500
Interest on 6 per cent convertible gold bonds of 1910..	43,015
Interest on 6 per cent notes of 1908.....	171,000
Interest on loans and notes payable.....	48,777
Interest on dividend certificates.....	80,241
Proportion of discount on 6 per cent notes of 1908...	15,000
Miscellaneous .....	2,537
Total .....	\$1,268,070
Total .....	\$1,343,093
Net income for the year.....	\$766,468
Profit and loss—surplus at beginning of year.....	1,602,311
Profit and loss—surplus, Dec. 31, 1910.....	\$2,368,779

The statement of the United Railroads of San Francisco for the year ended Dec. 31, 1910, is as follows:

Gross earnings:	
Passenger .....	\$7,605,489
Advertising .....	48,000
Total .....	\$7,653,489
Operating expenses:	
Maintenance of way and structures.....	\$344,758
Maintenance of equipment.....	633,386
Transportation expenses .....	2,770,212
General expenses.....	532,814
Total .....	\$4,281,170
Ratio to gross earnings, 55.94 per cent.	
Taxes and licenses.....	448,100
Ratio to gross earnings, 5.85 per cent.	
Total operating expenses and taxes.....	\$4,729,270
Ratio to gross earnings, 61.79 per cent.	
Net earnings .....	\$2,924,219
Other income:	
Interest .....	\$59,213
Rents .....	4,938
Miscellaneous .....	26,127
Total .....	\$90,278
Gross income .....	\$3,014,497
Deductions:	
Interest on 5 per cent promissory gold notes.....	\$50,000
Interest on income notes (deferred obligations).....	43,015
Interest on equipment notes.....	10,133
Interest on bills and accounts payable.....	56,497
Rentals and leases .....	73,463
Total .....	\$233,108
Net income before bond interest charges.....	\$2,781,389
Bond interest:	
United Railroads bonds.....	\$1,013,360
Underlying bonds .....	799,050
Total .....	\$1,812,410
Net income before sinking fund charges.....	\$968,979
Sinking funds .....	367,070
Surplus for period.....	\$601,909

Ernst Thalmann, the president of the United Railways Investment Company, says, in part:

"Since the supply of electric power by the Sierra & San Francisco Power Company began, June 7, 1910, not only has there been a very substantial saving to the United Railroads of San Francisco in the cost of such power, but the supply has been furnished so continuously as to render the operation of its cars most effective.

"The work in connection with the Sierra & San Francisco Power Company has now been substantially completed, and the results therefrom have fully satisfied the expecta-

tions of the directors of your company. While the marketing of the surplus power of the company has necessarily been deferred until completion of its construction work, it is now expected that a considerable part of this surplus will be disposed of during the present year throughout the territory served and its income materially increased.

"The statement of the earnings of the Sierra & San Francisco Power Company furnished by its officers to the president of your company from Oct. 1, 1910, when the permanent power contract with the United Railroads of San Francisco became operative, to March 31, 1911, a period of six months, is as follows: Gross earnings, \$390,377; operating expenses and taxes, \$133,812; net earnings, \$256,565; interest on first mortgage bonds, \$157,274; net income, \$99,291.

"It is gratifying to note the continued improvement in the earnings of the Philadelphia Company. The gross earnings for the year ended Dec. 31, 1910, show an increase of \$2,005,238 over the year 1909. Dividends upon the common stock of the Philadelphia Company were paid during the year 1910 to the amount of 7 per cent, which included an extra dividend of 1 per cent, declared June 7, 1910, the regular dividend being 6 per cent.

"During 1910 many permanent improvements have been made to the physical properties of the Philadelphia Company and those of its subsidiary and controlled companies.

"About March 20, 1911, 200,000 shares of the common stock of the Philadelphia Company were officially listed upon the parquet of the Paris Bourse. Your directors believe that the result of this action, which was accomplished only after prolonged negotiations, will be beneficial not only to the holders of the securities of the Philadelphia Company, but to the stockholders and security holders of your company.

"Since Dec. 31, 1910, an additional instalment of the 6 per cent notes of 1908, amounting to \$200,000, was paid at maturity, Feb. 15, 1911, thus reducing the outstanding amount of such notes to \$2,500,000."

The statement of assets of the company shows the following securities owned: 50,000 shares of first preferred stock, 200,000 shares of preferred stock and 80,014 shares of common stock of the United Railroads of San Francisco, of a par value of \$100 each; 484,000 shares of common stock of the Philadelphia Company, of a par value of \$50; 55,000 shares of the capital stock of the Railroad & Power Development Company, of a par value of \$100 a share, and other securities to the extent of \$362,910, totaling to \$61,295,981.

Chicago (Ill.) Elevated Railways

The merger committee, consisting of F. A. Vanderlip, Henry A. Blair and Samuel McRoberts, has given notice to the stockholders of the South Side Elevated Railroad, the Metropolitan West Side Elevated Railway and the Northwestern Elevated Railroad that they are prepared to receive deposits of the stock of the companies with the National City Bank of New York and the Illinois Trust Savings Bank, Chicago, under terms of the merger agreement. Deposits must be made prior to July 1, 1911. As previously stated in the ELECTRIC RAILWAY JOURNAL, the National City Bank, New York, N. Y., has agreed to purchase the \$30,000,000 of three-year 5 per cent mortgage notes and \$16,000,000 of 6 per cent cumulative preferred stock. The merger will be effective if sufficient assents are received by purchasing the shares of depositing stockholders with cash, or cash and securities in accordance with the terms of the deposit agreement.

The salient feature of the plan calls for the organization of the Chicago Elevated Railways as a voluntary association along the same lines as the Mackay Companies, Massachusetts Electric Companies, Massachusetts Gas Companies and the Chicago City & Connecting Railways. The new company will issue \$30,000,000 of three-year 5 per cent collateral notes, 160,000 shares without par value to be called 6 per cent cumulative preferred shares, and 250,000 shares to be called common shares. The cash requirements, if cash only is given for stocks, will aggregate \$44,500,000, as follows: \$18,000,000 to pay bonds of the Northwestern Elevated Railroad due on Sept. 1, 1911; \$3,022,000 to pay floating debt, accrued interest, taxes, etc.; \$21,202,312 for stocks (100 per cent basis) of the Northwestern Elevated Railroad,

Metropolitan West Side Elevated Railway and the South Side Elevated Railroad; \$2,275,688 for working capital and expenses of plan and of organization.

The basis of the cash option is \$75 a share for the stock of the South Side Elevated Railroad, \$75 a share for the preferred stock and \$27.50 a share for the common stock of the Metropolitan West Side Elevated Railway and \$70 a share for the preferred stock and \$30 a share for the common stock of the Northwestern Elevated Railroad. On this basis \$6,530,925 would be required to retire the \$8,707,900 of outstanding preferred stock of the Metropolitan West Side Elevated Railway and \$2,052,627 to retire the \$7,464,100 of common stock of the company; \$3,461,080 would be required to retire the \$4,944,400 of preferred stock of the Northwestern Elevated Railroad and \$1,484,130 to retire the \$4,947,100 of common stock of the company, and \$7,673,550 to retire the \$10,231,400 stock of the South Side Elevated Railroad.

#### Reorganization of Companies at Lexington, Ky.

The reorganization of the Lexington & Interurban Railway, Lexington, Ky., has been concluded. The Kentucky Securities Corporation was incorporated in Virginia with an authorized capital stock of \$5,000,000, of which \$2,500,000 is 6 per cent preferred, and took over as the parent holding company the securities on deposit in the name of the Lexington & Interurban Railway.

The Kentucky Traction & Terminal Company was organized with an authorized capital stock of \$2,500,000 and has taken over as the operating company the Lexington Railway, the Bluegrass Traction Company and the Central Kentucky Traction Company. The Kentucky Traction & Terminal Company has filed a new first and refunding mortgage dated May 18, 1911, to the Commercial Trust Company, Philadelphia, Pa., as trustee, to secure an authorized issue of \$7,500,000 of thirty-year 5 per cent bonds. These bonds are guaranteed as to principal and interest by the Kentucky Securities Corporation. Of these bonds the unsold portion of a total of \$1,871,000 was offered for public subscription on June 1, 1911, at 94 and interest. The proceeds of \$800,000 of this issue will be expended to construct a new power plant and provide other improvements and the remaining \$1,071,000 will be used to refund underlying bonds.

The Kentucky Securities Corporation has announced the payment in full of \$850,000 of secured loans taken over from the Lexington & Interurban Railways. Of these loans \$750,000 were extended for one year from May 20, 1911, but the holding company was enabled to anticipate the payment of the loans owing to the rapid sale of the bonds of the Kentucky Traction & Terminal Company. This leaves the Kentucky Securities Company without any bonded or floating debt, and a cash balance of \$700,000 is also available for the Kentucky Traction & Terminal Company for betterments and improvements.

The Kentucky Traction & Terminal Company has organized as follows: President, Percy M. Chandler, Philadelphia, Pa.; vice-president, F. W. Bacon, Lexington, Ky.; secretary, T. D. Murray, Lexington, Ky.; assistant secretary, James K. Trimble, Philadelphia, Pa.; treasurer, J. Will Stoll, Lexington, Ky.; assistant treasurer, James W. McMeekin, Lexington, Ky.; general manager, I. L. Oppenheimer, Lexington, Ky.; general counsel, R. C. Stoll, Lexington, Ky.; general solicitor, Col. John R. Allen; R. C. Stoll, J. E. Bassett, Desha Breckinridge, C. N. Manning, F. W. Bacon, Lexington, Ky.; Senator V. M. Arnett, Nicholasville, Ky.; Col. Charles E. Hoge, Frankfort, Ky.; Johnson N. Camden, Versailles, Ky.; John R. Downing, Georgetown, Ky.; Percy M. Chandler, Howard A. Loeb, J. Levering Jones, John A. McCarthy, John B. McAfee and Gustavus W. Cook, Philadelphia, Pa., directors.

**American Railways Company, Philadelphia, Pa.**—The American Railways Company states that the report is incorrect that it is negotiating for the purchase of the Joplin & Pittsburgh Railway, referred to in the *ELECTRIC RAILWAY JOURNAL* of June 3, 1911, page 992.

**Joliet & Southern Traction Company, Joliet, Ill.**—At the conclusion of a meeting of the bondholders and creditors of the Joliet & Southern Traction Company in Chicago recently to consider the affairs of the company, which is

now in the hands of H. A. Fisher and Daniel Peterkin, receivers, the following statement was made by Mr. Fisher: "We discussed affairs pertaining to the organization of the company and Mr. Reynolds was empowered to appoint a bondholder committee to devise means for this end. The committee is to consist of five members, possibly seven. They will meet with Mr. George M. Reynolds, of the Continental National Bank, Chicago, Ill., and other parties interested and consider ways and means for the reorganization and the changes necessary for the economic management of the road."

**J. G. White & Company, Inc., New York, N. Y.**—J. G. White & Company, Inc., have issued their eighth annual report, for the fiscal year ended Feb. 28, 1911. The surplus for the year shows an increase from \$391,394.15 to \$485,529.04. The other important changes are a decrease in deferred charges and plant and tools and equipment, less depreciation, from \$331,160.45 to \$148,902.74, and an increase in securities owned and syndicate participations from \$1,765,816.19 to \$2,317,959.33. J. G. White, president of the company, says in part: "Nearly all of the properties in which your company is interested have shown during the past year substantial and satisfactory increases in earnings, and some of them have also increased their rate of dividends, so that the income from securities owned is gradually and substantially increasing. While in general there is not great activity in engineering and construction lines, it is pleasant to report that your company has recently secured a considerable amount of new work, and has fair prospects of securing considerably more work of this sort in the near future."

**Massachusetts Electric Companies, Boston, Mass.**—At the special meeting of the stockholders of the Old Colony Street Railway and the Boston & Northern Street Railway it was unanimously voted to merge. The capital of the Boston & Northern Street Railway will be increased by 7767 preferred and 80,041 shares of common stock, valued at \$780,800, to be exchanged for preferred and common stock respectively of the Old Colony Street Railway.

**New Orleans Railway & Light Company, New Orleans, La.**—Time for the deposit of the preferred stock and common stock of the New Orleans Railway & Light Company in accordance with the plan to merge the company and the American Cities Railway & Light Company was extended until June 7, 1911.

**Northwestern Railways Company, Meadville, Pa.**—The Northwestern Railways Company, which took over the Meadville Traction Company, Meadville & Conneaut Lake Traction Company and the People's Incandescent Light Company, Meadville, as noted in the *ELECTRIC RAILWAY JOURNAL* of March 18, 1911, page 478, has concluded negotiations to take over the Meadville & Cambridge Springs Street Railway on July 1, 1911.

**Rhode Island Company, Providence, R. I.**—The New York, New Haven & Hartford Railroad, through the Rhode Island Company, has concluded leases for 999 years of the Providence & Danielson Railway, Providence, R. I., and the Sea View Railroad, Wickford, R. I., both of which are controlled by the same interests, the majority interest in the Sea View Railroad having recently passed to D. F. Sherman, president of the Providence & Danielson Railway, as noted in the *ELECTRIC RAILWAY JOURNAL* of March 4, 1911. The leases date from June 30, 1911. In the case of the Providence & Danielson Railway the lessee company is to pay 1 per cent upon the stock of \$1,000,000, interest upon the bonds, taxes and all other fixed charges. Thirty thousand dollars is to be paid immediately to the Providence & Danielson Railway as interest for the past year on bonds which are in default. In the case of the Sea View Railroad, the lessee company is to pay 1 per cent upon the \$700,000 of capital stock of the company on June 30, 1912 and 1913; 2 per cent at the same date in 1914, 1915 and 1916; 3 per cent upon the same date in 1917, 1918 and 1919; 4 per cent upon the same date in 1920 and 1921, and 5 per cent in 1922 and after years. D. F. Sherman, president of the Providence & Danielson Railway and the Sea View Railroad, issued a statement in regard to the leasing of the roads in which he said in part: "As an independent organization the Providence & Danielson Railway is and has been operated at a disadvantage; it has not paid a dividend nor earned all the

interest on its bonds and it seems doubtful if it can be made to earn sufficient revenue above current expenses to maintain its property in good condition and to provide for improvements and betterments and against depreciation which will necessitate the purchase of new cars and equipment when in the course of time present property is worn out. As a part of a large system many economies can be made and a plan has been devised and agreed upon whereby the holders of the securities of the company are to contribute about \$250,000, to be expended upon the property, thus insuring a more economical and efficient operation of the road. Under those conditions the Rhode Island Company became willing to lease the property for a long period and pay as rental the interest on outstanding bonds and a nominal dividend on the stock, and in connection with such lease assurances have been required protecting the Southern New England in the use of any portion of the property of the Providence & Danielson Railway it may later find it convenient or desirable to use in connection with the extension of the Grand Trunk System into this State." On June 3, 1911, it was announced that the Rhode Island Company had leased the Narragansett Pier Railroad for ninety-nine years and would electrify the road and operate it in connection with the Sea View line.

**Yonkers (N. Y.) Railroad.**—The Public Service Commission of the Second District of New York has authorized Leslie Sutherland, receiver of the Yonkers Railroad, to issue \$91,000 in receiver's certificates, the proceeds to be used to construct the Nepperhan Avenue line, which the commission has authorized to be built.

**MONTHLY ELECTRIC RAILWAY EARNINGS**

AURORA, ELGIN & CHICAGO RAILROAD.						
Period.		Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.
1m.,	Apr. '11	\$130,914	\$76,037	\$52,577	\$35,571	\$17,306
1 "	" '10	120,384	71,150	49,234	33,310	15,924
10 "	" '11	1,421,542	822,187	599,355	344,264	255,091
10 "	" '10	1,302,282	726,760	575,523	307,266	268,257
BROOKLYN RAPID TRANSIT SYSTEM.						
1m.,	Feb. '11	\$1,591,046	*\$1,138,373	\$452,672	.....	.....
CLEVELAND, PAINESVILLE & EASTERN RAILROAD.						
1m.,	Apr. '11	\$26,573	*\$14,672	\$11,901	\$8,172	\$3,729
1 "	" '10	25,207	*14,019	11,188	7,931	3,257
4 "	" '11	94,814	*55,125	39,690	32,692	6,998
4 "	" '10	90,062	*51,441	38,621	31,678	6,944
DALLAS ELECTRIC COMPANY.						
1m.,	Mar. '11	\$129,528	\$83,936	\$45,592	\$27,617	\$17,976
1 "	" '10	114,849	77,240	37,608	26,347	11,261
12 "	" '11	1,515,221	959,920	555,301	311,960	243,341
12 "	" '10	1,359,384	864,695	494,689	330,458	164,231
HUDSON & MANHATTAN RAILROAD.						
1m.,	Feb. '11	\$235,947	*\$112,651	\$123,297	.....	.....
INTERBOROUGH RAPID TRANSIT COMPANY.						
1m.,	Feb. '11	\$2,433,469	*\$1,174,870	\$1,258,599	.....	.....
LAKE SHORE ELECTRIC RAILWAY.						
1m.,	Apr. '11	\$91,958	*\$53,207	\$38,751	\$34,614	\$4,137
1 "	" '10	86,915	*48,513	38,402	34,903	3,500
4 "	" '11	339,314	*200,518	138,797	138,814	†18
4 "	" '10	322,770	*193,470	129,300	138,823	†9,323
METROPOLITAN STREET RAILWAY.						
1m.,	Feb. '11	\$975,696	*\$775,138	\$200,557	.....	.....
NORTHERN OHIO TRACTION & LIGHT COMPANY.						
1m.,	Apr. '11	\$200,015	*\$114,762	\$85,253	\$45,116	\$40,137
1 "	" '10	173,763	*103,683	70,080	43,291	26,789
4 "	" '11	748,886	*437,384	311,502	178,232	133,270
4 "	" '10	658,339	*389,855	268,483	173,166	95,316
TAMPA ELECTRIC COMPANY.						
1m.,	Mar. '11	\$56,804	\$28,252	\$28,552	\$6,256	\$22,295
1 "	" '10	54,061	28,083	25,978	4,566	21,412
12 "	" '11	596,621	327,574	269,047	69,559	199,487
12 "	" '10	607,394	344,248	263,146	55,907	207,239
THIRD AVENUE RAILROAD.						
1m.,	Feb. '11	\$259,867	*\$145,309	\$114,558	.....	.....
TOLEDO RAILWAYS & LIGHT COMPANY.						
1m.,	Apr. '11	\$267,547	\$163,420	\$104,127	\$79,225	\$24,901
4 "	" '11	1,047,335	667,677	379,659	317,130	62,528
TWIN CITY RAPID TRANSIT COMPANY.						
1m.,	Apr. '11	\$620,672	\$319,940	\$300,732	\$140,079	\$160,653
1 "	" '10	584,378	268,045	316,332	140,209	176,103
4 "	" '11	2,441,711	1,290,471	1,151,240	560,317	590,924
4 "	" '10	2,303,698	1,157,069	1,146,628	560,916	585,711
UNION RAILWAY, NEW YORK.						
1m.,	Feb. '11	\$150,858	*\$131,078	\$19,780	.....	.....

\*Includes taxes.  
†Deficit.

**Traffic and Transportation**

**No-Seat-No-Fare Ordinance in Portland, Ore.**

It is proposed in Portland, Ore., to submit to the voters at the next regular city election an initiative petition in regard to the following proposed no-seat-no-fare ordinance:

"Section 1.—All companies, corporations or persons operating street railways within the limits of Portland are hereby required to run within the city limits a sufficient number of cars between 6:30 a. m. and 9 a. m. and 4:30 p. m. and 7 p. m. to provide with a seat every passenger from whom a fare is demanded, and it shall be unlawful between and during the hours aforesaid to demand any fare from any passenger until a seat has been provided.

"Section 2.—It shall be unlawful for any company, corporation or person operating street railways or a street railway within the limits of Portland to permit any person to board or remain upon any car between the hours of 6:30 a. m. and 9 a. m. and 4:30 p. m. and 7 p. m. unless there is a seat in such car for such person, and no person or persons shall be permitted at any time to crowd the aisle or platforms of this street car.

"Section 3.—That such companies, corporations or persons shall run a sufficient number of cars within this city during the hours of 6:30 a. m. to 9 a. m. and during the hours of 4:30 p. m. to 7 p. m. that persons desiring transportation thereon shall not be kept waiting longer than five minutes after being unable to secure a seat in a car.

"Section 4.—All ordinances or parts of ordinances heretofore existing and in conflict with any of the provisions of this ordinance are hereby repealed.

"Section 5.—Any company, corporation or person charged with the general operation of a street railway who shall violate any provision of this ordinance shall upon conviction thereof be punished by a fine not less than \$25 and not exceeding \$100 for each offense, and the acts of the agents and employees shall be deemed the acts of the company, or person, within the meaning of this ordinance.

"An ordinance providing that during certain hours each passenger of a street car operated in Portland from whom a fare is demanded shall be furnished a seat in such car and making it unlawful to demand such fare until a seat is provided, and making it unlawful during certain hours to permit any person to board or remain upon any street car in which no seat is available for such person."

B. S. Josselyn, president of the Portland Railway, Light & Power Company, issued a statement in regard to the proposed ordinance in which he said:

"That title, 'no seat, no fare,' is a misnomer, because the measure would not permit anyone to ride on the cars without paying fare. It would simply mean that only persons whom it would be possible to provide with seats could ride.

"The measure provides that a person shall not be kept waiting longer than five minutes for a car with a seat, a provision impossible to carry out because it is a physical impossibility during the rush hours, to which hours the proposed law is intended to apply.

"To make operative this law would result in riot that would disrupt completely the service and give the people no alternative but to walk. It would be unlawful for us to permit anyone to board a car unless that person could be provided with a seat.

"The company would be arrested if it carried people not provided with seats and people boarding cars and not finding a seat would make themselves liable to arrest and fine. The result would be a mix-up that could never be straightened out and it would never meet with public approval.

"I think it well that the people be warned against the misleading title of this proposed measure, for I feel confident that the general belief is that it means no seat, no fare, whereas it means no seat, no ride."

In order to bring the fallacy of the ordinance forcibly to the attention of its patrons, the Portland Railway, Light & Power Company is using the backs of its transfers to point out the discomfort that will result to its patrons if the measure is enacted. Paragraphs follow which have appeared recently on transfers:

"If you and your wife want to take the same car and but one seat is vacant, you can take that—she can come along in the next car."

"How would the people attending the baseball games get home? Apply the 'no-seat-no-ride' proposition to your own business. Could you furnish enough help to keep patrons from waiting all the time?"

"Would this [meaning the proposed ordinance] be unreasonable for a department store? If so why is it not unreasonable as it stands?"

#### Accidents in New York City in March

The Public Service Commission of the First District of New York has issued the following comparative summary of accidents during March, 1909, 1910 and 1911, on the street railways which come within its jurisdiction:

March.	1909.	1910.	1911.
Car collisions.....	77	79	78
Persons and vehicles struck by cars.....	923	969	1,380
Boarding .....	571	759	741
Alighting .....	509	679	570
Contact electricity.....	16	24	23
Other accidents.....	1,618	1,782	1,782
Totals .....	3,714	4,292	4,574
Passengers .....	1,531	1,965	1,840
Not passengers.....	505	513	478
Employees .....	246	289	330
Totals .....	2,282	2,767	2,648
Serious (included in above):			
Killed .....	13	12	17
Fractured skulls.....	16	10	4
Amputated limbs.....	4	..	3
Broken limbs.....	29	34	21
Other serious.....	98	118	89
Totals .....	160	174	134

The grand total of revenue passengers carried by the companies in March, 1909, was 118,768,565; in March, 1910, 131,760,785, and in March, 1911, 135,040,000, while the grand total of revenue car miles was 23,059,533 in March, 1909; 24,697,510 in March, 1910, and 25,191,000 in March, 1911.

#### Employees in Denver Exchange Transfer Ideas

The *Tramway Bulletin* for May, 1911, which is the official organ of the Tramway Mutual Aid Association, which is composed of employees of the Denver (Col.) City Tramway, contains a series of communications from conductors of the company in which they express their ideas in regard to transfers. One of the conductors, J. C. Black, in reviewing his method of dealing with passengers who present old or defective transfers gave some very pertinent advice to his fellows. He said in part:

"When a passenger hands me a transfer that is not acceptable on my line for any reason I lower my voice and as privately as possible I tell that passenger the transfer cannot be accepted and take the time to show him why. I find that about three-fourths of them will pay me; to the others, when I find they will not pay, I tell that if I accept the transfer I must have their name and address, as I must send it in with the transfer so the company can investigate if it sees fit. I give them the impression that their name and address must accompany the transfer if it is turned in to the company, as it is imperative with me.

"Some people are naturally timid about giving their names and will pay instead. Some, if they are telling a lie about their transfers, will pay if they think there is a chance of the company investigating the matter. Others will say, 'Oh, well, if you have to go to all that trouble I'll just pay you; here is 5 cents.'

"Others will not pay under any consideration, so I just take their names and addresses and give them the impression that these will be sent to the office with the transfer. You may ask what good it does to go to all that trouble of getting names, etc. It does a great deal of good; if the person was honest and it was the carelessness of the conductor issuing the transfer, then that person will likely watch the next transfer he accepts, for in all probability that person's mind was a thousand miles off when he accepted the transfer. You all see such people every day; they get on the car, sit down, don't know they have to pay until the conductor taps them on the shoulder; they don't know they want a transfer until the conductor suggests it to them;

they take the transfer without looking at it and carefully fold it six times and stick it away in some nook or corner of their pocket. That person gets on the next car and can't find his transfer, or forgets he had a transfer, pays a cash fare and just before getting off the car comes to you with the transfer and asks you if you can refund his fare.

"On the other hand, if that person was not honest and telling you a lie, we know he would like to beat the company well enough, but when it comes to telling a lie and then virtually signing that lie, that is a different thing; he will be careful. Some people will pay if they think the conductor will be the loser; there isn't a conductor on the system who has not heard people express this sentiment, as not desiring to beat the conductor, but the company. Such people are not our friends and will bear watching at any and all times.

"So far I have never failed to get either 5 cents or name and address, and when I succeed in getting only the name and address I feel as though I have accomplished something."

**Increase in Wages in Allentown.**—The Lehigh Valley Transit Company, Allentown, Pa., has announced an advance in wages of conductors and motormen 1 cent an hour beginning July 1, 1911. Present wages are 21 cents to 24 cents per hour, according to the period of service.

**Suburban-Elevated Operating Agreement in Chicago.**—Preliminary negotiations are reported to have been completed between the receivers of the Chicago & Milwaukee Electric Railroad and the elevated railroad merger syndicate by which the Chicago & Milwaukee Electric Railroad will operate into Chicago over the Northwestern Elevated Railroad.

**Sterling, Dixon & Eastern Electric Railway to Abandon Park.**—The Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., has decided to abandon Electric Park, midway between Sterling and Dixon, as the property has not been profitable. The east end of the road at Dixon serves a Chautauqua assembly park and near the west end of the road at Sterling is Minerva Springs Park.

**Limited Service on Indiana Line Discontinued.**—The Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., has discontinued its through limited service between New Castle and Indianapolis by way of Duneith. The company will continue to operate the spur line between New Castle and Duneith to connect with the main line to Richmond and Indianapolis.

**Fare Complaint Against a Long Island Company.**—A complaint has been filed with the Public Service Commission of the Second District of New York asking that the New York & Long Island Traction Company be required to reduce its fare between Belmont Park and Front Street and Main Street in Hempstead from 10 cents to 5 cents. Under the terms of a franchise granted to a predecessor corporation, complainant states the company should not exact more than 5 cents for a ride five miles or less within the town of Hempstead.

**Long Island Railroad Asked to Reduce Local Fare.**—The Public Service Commission of the First District of New York has requested the Long Island Railroad to answer a complaint order as to why the company should not extend the 5-cent fare zone on its line between Flatbush Avenue, Brooklyn, and Jamaica, from Warwick Street, Brooklyn, to Railroad Avenue, Brooklyn. A bill to require the company to reduce the fare between Flatbush Avenue and Railroad Avenue was passed by the Legislature, but Governor Dix vetoed the measure on the ground that it tended to usurp the authority of the Public Service Commission.

**New Jersey Board Modifies Operating Order.**—The Board of Public Utility Commissioners of New York has modified two orders, one of Dec. 21, 1909, the other of July 26, 1910, granting permission to the North Jersey Rapid Transit Company to cross certain streets and highways at grade. One of the conditions upon which permission was granted was that the company should operate its cars singly and not in trains. This condition has been modified so as to permit the operation of trains with three cars as a unit, but only on occasions when the usual one-car service is

insufficient for the traffic, or when special conditions require the transportation of church, fraternal and other organizations.

**Gates Give Satisfaction in Louisville.**—Officials of the Louisville (Ky.) Railway are pleased with the operation of the safety gates which were installed on the cars of the Portland Avenue line as an experiment a few months ago. It has been possible to maintain the same schedules; the number of accidents has been appreciably reduced and no difficulty has been encountered in the operation of the device. While no decision has been made as to the equipment of the other lines with similar barriers, it is expected that this will be done in the near future. The gates are divided into four parts, the central two swinging from a common center, which is the guide post for the pay-as-you-enter system, and the other parts hinging respectively on the back of the platform and the body of the car.

**Auto Races Increase Traffic.**—The interurban electric railways which enter Indianapolis operated 122 extra trains into the terminal station at Indianapolis and the same number of extra trains out of the station on May 30, 1911, the day on which the automobile races were held on the Indianapolis speedway, making the total movement 725 trains. It is estimated that these trains carried 60,000 passengers. Not an accident has been reported. The Indiana Railroad Commission has commended the interurban railways for handling so successfully the large crowds which attended the races on May 30, 1911. Chairman Wood, of the committee, said: "We found the companies obeying the rules of the commission to the letter. We were particularly interested in ascertaining if any of the motormen permitted passengers in their compartments, and we found no instances where the rule against passengers in such compartments was violated."

**Traffic Arrangement Between New York Suburban Line and City Company.**—The Public Service Commission has approved the terms of an agreement entered into between Leslie Southerland, receiver of the Yonkers Railroad, and Frederick W. Whitridge, receiver of the Union Railway, by which cars of the Yonkers Railroad will be run over the Union Railway so that passengers can reach the up-town terminal of the Third Avenue elevated line of the Interborough Rapid Transit Company, the Ninth Avenue elevated line of that company, or the Broadway branch of the subway. Passengers will thus be able to reach any part of Manhattan from Yonkers for 10 cents, whereas before the fare was 15 cents. This arrangement has been in operation for some time under an informal agreement between the two companies, but heretofore passengers have only been able to reach the Broadway extension of the subway. The arrangement by which they reach the elevated is new.

**Traffic at Little Rock During Confederate Reunion.**—The reunion of Confederate veterans, which was held in Little Rock, Ark., in May, was the most successful in point of number in attendance which has ever been held. The reunion lasted four days, and during that time the Little Rock Railway & Electric Company handled an average of 200,000 passengers a day without a serious accident. The company had available for service sixty-five cars, thirty-five of which were single-truck cars. Of the single-truck cars ten were ten-bench open cars and twenty-five were side-seat closed cars. D. A. Hegarty, vice-president and general manager of the company, received unstinted praise from the newspapers and from those in attendance at the reunion for the service furnished by the company and the able and courteous treatment of strangers by the employees of the company. In recognition of the work of the employees during the reunion, Mr. Hegarty addressed the following letter to the men: "It is with great pleasure and pride that we extend to you the congratulations of the officers of the company for the faithful, efficient and especially polite service rendered during the Confederate veterans' reunion, as a more trying situation on your patience could not have been possible, and to move this vast crowd of people without a serious accident has been a marvelous record of which the officials of this company and the employees of the same have good reason to feel proud. To further show their appreciation of your good and loyal services, the officers of the company have granted to each employee a monetary bonus equal to three days' pay."

## Personal Mention

**Mr. R. J. Dunham**, who has been appointed a receiver of the Metropolitan Street Railway, Kansas City, Mo., with Mr. Ford Harvey, is the confidential representative of Mr. J. Ogden Armour. He is chairman of the board of directors of the Kansas City Railway & Light Company, president of the Sioux City (Ia.) Traction Company and president of the Stock Yard Company in Ft. Worth.

**Mr. John Leisenring**, signal engineer of the Illinois Traction System, Peoria, Ill., has been placed in charge of the overhead department of the company, including the transmission line, telephone lines, automatic signals and Blake signals and trolley wire. All employees of this department have been instructed to report to Mr. Leisenring instead of to Mr. Patterson, who has been relieved of these duties.

**Mr. J. B. Rowray**, whose resignation as superintendent of the north division of the Pacific Electric Railway, Los Angeles, Cal., to become superintendent of the Northern Electric Railway, Chico, Cal., was noted in the *ELECTRIC RAILWAY JOURNAL* of April 29, 1911, was presented with a diamond ring by his associates in the Pacific Electric Railway when he retired from the company.

**Mr. Ford Harvey**, who has been appointed a receiver of the Metropolitan Street Railway, Kansas City, Mo., with Mr. R. J. Dunham, was born in Leavenworth, Kan. After he left college Mr. Harvey entered the service of his father and is now president of the Fred Harvey system, which operates a system of restaurants on the Atchison, Topeka & Santa Fé Railway from Chicago to the Pacific Coast and to the Gulf of Mexico.

**Mr. Frank H. Sommer**, whose term of office as a member of the State Board of Public Utility Commissioners of New Jersey expired on May 1, 1911, has been retained as counsel to the commission in accordance with the provision of the new utility law which gives the board authority to engage counsel. Heretofore the commission has referred to the Attorney-General of the State all questions which required an expression of legal opinion.

**Mr. J. Sergeant Cram** has been appointed a member of the Public Service Commission of the First District of New York to succeed Mr. Edward M. Bassett, whose term of office expired in February, 1911. Mr. Cram was born in New York City in 1852. He was educated at Exeter Academy and at Harvard. He entered public life in the time of Mayor Hugh Grant. Later he was appointed head of the Dock Board of New York. Mr. Cram is chairman of the general committee of Tammany Hall.

**Mr. Edward M. Bassett**, whose term of office as a member of the Public Service Commission of the First District of New York expired in February, 1911, will retire from the commission now that Governor Dix has announced the appointment of Mr. J. Sergeant Cram as his successor. Mr. Bassett's greatest service to the commission has been in connection with framing the new rapid transit law and in pushing the elimination of dangerous grade crossings. Mr. Bassett will return at once to the law firm of which he is a member and resume the practice of his regular calling.

**Mr. Frank S. Gannon**, formerly vice-president of the New York City Railway, has opened an office in New York and will devote himself to technical work in examinations and appraisals of railway properties and as advisory counsel. Mr. Gannon was recently president of the Norfolk & Southern Railroad. He was born in Spring Valley, N. Y., and began railway work in November, 1868, as a telegraph operator on the Delaware division of the Erie Railroad. Later he served on the New Jersey Midland Railroad, now a part of the New York, Susquehanna & Western Railroad; the Long Island Railroad; the Baltimore & Ohio Railroad; the New York City & Northern Railroad, now a part of the New York Central & Hudson River Railroad, and the Staten Island Rapid Transit Railroad. In January, 1897, Mr. Gannon was elected third vice-president and general manager of the Southern Railway, and from March, 1902, to November, 1902, he was third vice-president of the company. From 1905 to 1909 he was vice-president of the Atlantic & North Carolina Railroad and president of the Norfolk Southern Railroad, which succeeded the Atlantic & North Carolina Railroad.

# Construction News

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

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

## RECENT INCORPORATIONS

**\*Clear Lake Railroad, Lakeport, Cal.**—Incorporated in California to build a 44-mile electric railway from Hope-land to Lakeport, with branches to Upper Lake and Kelseyville. Surveys will be begun at once by C. R. Rankin. Capital stock, \$500,000. Directors: L. H. Boggs and M. M. Gopcevic, Kelseyville; C. M. Hammond, Upper Lake; Duville Howard, H. V. Keeling, Joseph Levy, M. S. Sayre, Z. T. Spencer, A. H. Spurr, all of Lakeport; S. E. Brooks, Hopeland; C. C. McMahon, Bartlett Springs.

**\*San Joaquin Delta Railroad, Stockton, Cal.**—Incorporated in California to build an electric railway from Stockton across the Delta country to a point in Contra Costa County. Capital stock, \$500,000. Directors: E. S. Wood, L. H. Wood, W. P. Plummer, I. L. Borden, F. A. West, E. L. Wilhoit and M. E. Cerf.

**\*Central Terminal Railway, Chicago, Ill.**—Application for a charter has been made by this company in Illinois to build a railway from Forest Park to Chicago. Capital stock, \$2,000,000. Incorporators and first board of directors: Donald R. McLennan, Charles E. Vroman, Joseph W. Hiner, Fayette S. Munro and John C. Vroman, all of Chicago.

**\*Cicero & Southwestern Railways, Chicago, Ill.**—Incorporated to build electric railways in Illinois. Capital stock, \$1000. Incorporators: Emil R. Rosenthal, Louis Cohern and Augustus J. C. Timm.

**\*Northern Illinois Industrial Company, Waukegan, Ill.**—Incorporated in Illinois to build an electric railway from North Chicago to Waukegan. Headquarters, Waukegan. Capital stock, \$50,000. Directors, C. E. Saylor, S. Schwartz, J. P. Arthur, Theodore H. Durst and M. H. Hussey, all of Waukegan, and John Sherwin, James T. Hayes, Dr. L. B. Jolley and M. C. Decker, all of North Chicago.

**\*Gary (Ind.) Connecting Railways.**—Application for a charter has been made in Indiana by this company to build an interurban railway through Porter and Lake Counties from Goodrum to Gary and Hammond; also to a point on the State line between Illinois and Indiana south to Hobart. Capital stock, \$500,000. Incorporators: V. O. Ward, I. A. Wheeler, P. W. Fitzhue, H. L. Ikes, W. L. Pollock, T. Persson and Richard D. Green, all of Chicago, Ill.

**\*Indianapolis, Chicago & Meridian Railway, Indianapolis, Ind.**—Application for a charter has been made by this company in Indiana to build an interurban railway to connect Indianapolis, Sheridan, Flora, Monticello, Francisville, Koutz, Valparaiso, Hobart, Wheeler, Gary, Hammond, Warsaw, Columbia City and Ft. Wayne and connecting with interurban lines near Hammond, Ill. Headquarters: Indianapolis. Incorporators: John A. Shafer, M. J. Moreland, Charles Beilheimer, Hoover Holton and M. B. Killer.

**Western Kentucky Electric Railways, Owensboro, Ky.**—Application for a charter will soon be made by this company in Delaware to build a 230-mile electric railway to connect Owensboro, Calhoun, Central City, Madisonville, Earlington, Nortonville, Dawson Springs, Bowling Green, Niagara, Sturgis, Calhoun, Ky., and Rockport, Ind. Preliminary arrangements are being made and \$25,000 is being subscribed for surveys and reports. The company will furnish power for lighting purposes. Capital stock authorized, \$2,000,000. Capital stock, issued, \$25,000. The H. U. Wallace & Company, 923 Marquette Building, Chicago, Ill., are the engineers. E. F. Wheaton, Owensboro, fiscal agent. Organization committee: Lee D. Ray, J. Ed. Guenther, D. C. Stimson, Dr. D. M. Griffith, George A. Cox, C. W. Wells and Haewes B. Eagles, all of Owensboro. [E. R. J., May 27, '11.]

**Pottstown & Phoenixville Railway, Pottstown, Pa.**—Incorporated in Pennsylvania to build an electric railway 1 mile long from Pottstown to Sanatoga Station. Capital stock, \$6000. George N. Malsberger, president; H. F.

Swinehart, Pottstown; C. Taylor Leland and Harry C. Case, Newtown, and C. W. Rambo, Spring City. [E. R. J., May 13, '11.]

## FRANCHISES

**Bakersfield, Cal.**—The San Joaquin Light & Power Corporation has asked the Council for a franchise on North Chester Street to the city limits.

**Lodi, Cal.**—The Central California Traction Company, San Francisco, has asked the City Trustees for a franchise on Sacramento Street in Lodi.

**San Diego, Cal.**—The San Diego & El Cajon Valley Interurban Railway has asked the Park Board for a franchise through the city park of San Diego.

**Turlock, Cal.**—The Tidewater & Southern Railroad has asked the City Council for a franchise to build its tracks through Turlock. The company has a similar application pending in Modesto. This line will connect Stockton, Modesto, Atlanta, French Camp, Turlock and Merced. K. C. Brueck, Stockton, president. [E. R. J., May 6, '11.]

**\*Florence, Col.**—B. F. Foor, representing the Florence Interurban Electric Company, has asked the City Council for a franchise to build an electric railway in Florence. This is part of a plan to construct an electric railway between Florence, Williamsburg, Rockvale and Coal Creek. Surveys are being made and most of the right-of-way has been secured.

**Kissimmee, Fla.**—The Citrus Southern Electric Railway, Sanford, has asked the City Council for a franchise in Kissimmee. This is part of a plan to build a 45-mile railway between Kissimmee, Sanford and Orlando. J. J. Brophy, Winter Park, general manager. [E. R. J., May 16, '11.]

**Atlanta, Ga.**—The Georgia Railway & Electric Company has received a franchise to extend its tracks three miles from Atlanta to the Brookhaven Country Club.

**Shelbyville, Ky.**—The Louisville Railway, which controls the Louisville & Interurban Railroad, has offered to pay \$15,000 for a franchise on Main Street, Shelbyville.

**New Iberia, La.**—The Southwestern Traction & Power Company, New Orleans, has received a twenty-five-year franchise from the City Council of New Iberia. The company has also asked the City Council of Jeanerette for a similar franchise to build its tracks over certain streets in Jeanerette. F. W. Crosby, Tenegre Building, New Orleans, president. [E. R. J., May 20, '11.]

**Housatonic, Mass.**—The Berkshire Street Railway, Pittsfield, has received a franchise from the Council for an extension in Housatonic.

**Red Wing, Minn.**—The St. Paul Southern Electric Railway, St. Paul, has received a franchise from the Council to build through Red Wing. [E. R. J., June 3, '11.]

**Tulsa, Okla.**—The Sand Springs Interurban Railway, Tulsa, has received a franchise from the Council to extend its tracks through Tulsa. This line will be extended to Collinsville and Oologah, where connection will be made with the Iron Mountain division.

**Hubbard, Pa.**—The Mahoning & Shenango Railway & Light Company, New Castle, has asked the Council for a franchise to double track its line through Hubbard, between the westerly village limits and Hubbard Junction.

**Lehigh Coal & Navigation Company, Philadelphia, Pa.**—The company states that it is not planning to build an electric railway from Summit Hill to Mauch Chunk, as stated in the issue of this paper last week.

**Providence, R. I.**—The Rhode Island Company, Providence, has received a franchise from the City Council to extend its tracks on Reservoir Avenue to the city limits in Providence.

**Spartanburg, S. C.**—The Greenville, Spartanburg & Anderson Railway has asked the City Council for a franchise through Spartanburg.

**Houston, Tex.**—The Galveston-Houston Electric Railway, Houston, has asked the City Council for a franchise authorizing it to change its route into Houston.

**\*Tyler, Tex.**—Thomas O'Hara and R. E. Hosket, Dayton, Ohio, have received a fifty-year franchise from the City Council to build an electric railway in Tyler.



**Blaine, Wash.**—The Nooksack Valley Traction Company, Bellingham, has received a fifty-year franchise from the City Council to build through Blaine. [E. R. J., May 27, '11.]

**Wheeling, W. Va.**—The Pan-Handle Traction Company, Wheeling, has received a franchise from the County Commissioners to build a third rail from the city limits of Wheeling to a point beyond Glennova.

**Janesville, Wis.**—The Janesville Traction Company, Madison, will ask the City Council for a franchise to extend its tracks on Main Street to its new freight office in Janesville.

#### TRACK AND ROADWAY

**Pacific Electric Railway, Los Angeles, Cal.**—Robert Sherer & Company, Los Angeles, has been awarded the contract by this company to build the 4½-mile extension from Glendale to Burbank.

**Oakland (Cal.) Traction Company.**—This company will double track its Northbrae line from University Avenue and Grove Street to the southern boundary of the Spring estate, in Berkeley.

**\*San Mateo, Cal.**—Percy L. Shuman, W. M. Roberts, San Mateo, and associates are interested in a plan to build a proposed electric railway between San Mateo and San Francisco, via Hillsboro. Capital for the construction of the line is ready if the right-of-way can be secured through Hillsboro and San Mateo for \$20,000.

**Watsonville Railway & Navigation Company, Watsonville, Cal.**—This company advises that it will let a contract at once for a concrete dock at Port Watsonville, on Monterey Bay, to cost \$100,000. It has 6 miles of track now in operation and will begin to build 8 miles of extensions in July. The line will connect San Francisco, Los Angeles, Watsonville, Freedom, Corralitos and Vega. It is securing franchises for other towns. The power house and repair shops are located at West Third Street, Watsonville. Capital stock, authorized, \$200,000. Capital stock, issued, \$150,000. Officers: F. E. Snowden, 311 California Street, San Francisco, president and general manager; W. F. Crosby, Watsonville, vice-president and superintendent; Clarence A. Shuey, 311 California Street, San Francisco, secretary, and H. Reeland, Watsonville, electrical engineer. [E. R. J., June 3, '11.]

**Georgia Railway & Electric Company, Atlanta, Ga.**—Work will be begun at once by this company to double track its Forrest Avenue line from Peachtree Street to Boulevard Street.

**Augusta-Aiken Railway & Electric Company, Augusta, Ga.**—It is reported that this company will improve its lines soon by eliminating many of its curves, reconstructing bridges and laying new ties.

**Sterling, Dixon & Eastern Electric Railway, Dixon, Ill.**—This company is planning to rehabilitate its tracks in Sterling, beginning at once. The work will be done under the jurisdiction of Clement C. Smith, president. Throughout the length of the city the present joint plates will be removed and the rail joints all cast-welded by the Falk process. The ties will be renewed where necessary and the paving relaid, using special grooved brick next to the rails and grouting with Portland cement. East of the business district new paving is to be laid and the grade of the tracks will be raised by inserting additional ballast of crushed stone and by laying a concrete foundation for the paving.

**Pekin & Petersburg Interurban Railway, Pekin, Ill.**—This company advises that it has begun the construction of its 7-mile electric railway to connect Pekin and Petersburg. Its repair shops will be located at Pekin and it will purchase power. The company will operate to cars. Capital stock, authorized, \$50,000. Bonds, issued, \$50,000. Officers: J. E. Melick, president, and G. A. McIntre, secretary, both of Springfield. [E. R. J., Jan. 7, '11.]

**Peoria Northern Railway, Peoria, Ill.**—This company advises that it has not decided when construction work will be begun on this electric railway to connect Peoria, Mossville, Rome, Chillicothe, Sparland, Henry and Bureau. Capital stock, authorized, \$2,500. Officers: H. E. Chubbuck, Peoria, president and general manager; H. J. Vance, La Salle, vice-president; W. H. Carnahan, Champaign, secretary, and W. J. Achelpohl, treasurer. [E. R. J., Feb. 29, '10.]

**\*Quincy & Terre Haute Railroad, Quincy, Ill.**—This company advises that it expects to procure a new charter in June after which contracts will be let for grading a 56-mile line to connect Quincy, Liberty, Beverly, Kingston and Baylis. The motive power will be gasoline or electricity. Capital stock, authorized, \$1,680,000. Bonds authorized, \$1,680,000. Officers: William C. Fick, 501 Ohio Street, Quincy, president; H. C. Simon, Virden, vice-president; F. W. Knollenberg, Quincy, secretary, and S. P. Landcraft, treasurer.

**\*Waterloo, Ia.**—A survey is being made for the construction of a second interurban line to Eagle Center, via Geneseo, Traer and Crystal.

**\*Houlton, Me.**—A new electric railway will be built this year between Woodlawn and New Sweden. It may later be extended to Caribou.

**Berkshire Street Railway, Pittsfield, Mass.**—This company has completed and placed in operation its 6-mile extension from Great Barrington south to Sheffield.

**Towson & Cockeysville Electric Railway, Cockeysville, Md.**—This company advises that it has awarded the contract to James H. Harlan Company for the grading and construction of its 7½-mile electric railway to connect Towson and Cockeysville via Lutherville, Timonium, Texas and Marble Hill. Construction has been begun. Capital stock, \$100,000. Officers: J. Alexis Shriver, Belair, president, general manager and purchasing agent; William H. Wright, vice-president, and James S. Nussear, secretary and treasurer. [E. R. J., May 13, '11.]

**Michigan United Railways, Lansing, Mich.**—Work will be begun at once by this company on the extension to connect Lansing, Owosso, and Saginaw. Right-of-way has been secured from Owosso to Swan Creek.

**Pine Brook Electric Railway, Caldwell, N. J.**—Alexander Dallas, president of this company, has deposited \$25,000 with the State Treasurer of New Jersey, which guarantees the construction of its 11-mile electric railway to connect Caldwell, Montville, Hanover, Fox Hill and Denville. This new line will be the last link in the electric railway between New York and Lake Hopatcong. [E. R. J., April 8, '11.]

**Yonkers (N. Y.) Railroad.**—The Public Service Commission, Second District, has granted its permission to the Yonkers Railroad to exercise franchises granted by Yonkers on April 4, 1911, for the construction of a line on Nepperhan Avenue in Yonkers from the intersection of Lake Avenue northerly to the north city line.

**Charlotte (N. C.) Rapid Transit Company.**—The contract has been awarded to W. J. Oliver & Company, Knoxville, by this company to build its line from the present terminus in Elizabeth Heights in Charlotte eastward to the Mecklenburg Country Club. Messrs. Flyler & Reid, Misenheimer, have been awarded the contract for 10,000 cross ties. Cameron Morrison, Charlotte, is interested. [E. R. J., Sept. 3, '10.]

**Carolina Light & Power Company, Raleigh, N. C.**—A preliminary survey has been made by this company to build a 3-mile extension from the Glenwood terminal of the Raleigh Street Railway to the Raleigh Country Club.

**Columbus Railway & Light Company, Columbus, Ohio.**—This company has placed an order for 1100 tons of girder rails with the Lorain Steel Company.

**Toronto (Ont.) Railway.**—Work has been progressing steadily on the extension of this company's lines within Toronto, started last fall. The special intersection work has been laid at Yonge and Adelaide Streets, Spadina and Adelaide Streets, and Spadina and Harbord Streets. Service on the latter street will be commenced as soon as the street is widened for vehicular traffic. The Wilton Avenue line is completed from the Don River to Church Street, and work is proceeding on the laying of the tracks over the Wilton Avenue bridge at the Don River.

**Willamette & Molalla Valley Railway, Canby, Ore.**—This company advises that it is closing final survey work and is securing right-of-way and will begin construction within ninety days on its 12-mile electric or steam railway from Canby through the Molalla Valley. W. J. Lee, Canby, president and general manager. [E. R. J., June 3, '11.]

**Erie (Pa.) Traction Company.**—Work has been begun by this company on a cut-off between Cambridge Springs and a point  $2\frac{1}{2}$  miles north of Cambridge Springs. This change is for the purpose of eliminating bad curves and shortening this line one-half mile.

**Northwestern Pennsylvania Railway, Meadville, Pa.**—This company, which has taken over the Meadville & Cambridge Springs Street Railway, will rehabilitate the entire line.

**\*Allegheny & Northwestern Street Railway, Pittsburgh, Pa.**—This company has filed for record at Pittsburgh a mortgage in favor of the Guaranty Title & Trust Company, Pittsburgh, as trustee, to secure an issue of \$700,000 of 5 per cent bonds, for a period of fifty years. This 27-mile railway will connect Evans City, Harmarville and Mars. Work was begun last fall by John Schaffner, Butler. It will connect with the Allegheny Valley Street Railway, Tarentum, at Harmarville.

**Rhode Island Company, Providence, R. I.**—It is announced that the Rhode Island Company, which has just arranged to lease the Narragansett Pier Railroad,  $8\frac{1}{2}$  miles long, will equip the road with electricity and operate it in connection with its Sea View line.

**Anderson, S. C.**—M. N. Patterson has secured right-of-way and a new survey will be made within ten days for the construction of a 30-mile electric railway to connect Anderson, Abbeville and Antreville. [E. R. J., May 6, '11.]

**Elizabethton, Milligan & Johnson City Electric Railway, Johnson City, Tenn.**—Preliminary surveys have been completed and work will be begun at once by this company on its 8-mile electric railway between Johnson City, Milligan, Oak Grove and Elizabethton. W. G. Payne is interested. [E. R. J., April 15, '11.]

**Bryan-College Interurban Railway, Bryan, Tex.**—A 2-mile extension will be built by this company at once from its present terminal on Caldwell Street out by the Allen Academy and as far as the Villa Maria Ursuline Convent. O. E. Gammill, Bryan, will do the grading.

**Marshall (Tex.) Traction Company.**—This company has completed and placed in operation its extension from Marshall to East Marshall.

**Mt. Mansfield Electric Railroad, Stowe, Vt.**—Work has been begun by this company on its extension from Stowe to Morrisville.

**Yakima Valley Transportation Company, North Yakima, Wash.**—Work has been begun by this company on its extension from North Yakima to Moxee City.

**\*Seattle, Wash.**—Plans are being considered for the formation of a company to build an electric railway from Lake Crescent through Port Angeles, Port Townsend and Irondale to some convenient point on Hood Canal, from which point fast boat service will be established to Seattle. Among those interested are: A. O. Powell, J. M. Sparkman, Jesse A. Frye, W. G. Anderson, John C. Walling and Rufus R. Wilson.

**Tacoma Railway & Light Company, Tacoma, Wash.**—This company has completed and placed in operation its 2-mile extension into the business section of Bismarck.

**Middle Island Railroad, Middlebourne, W. Va.**—This company has been voted a bond issue in Lincoln district of \$200,000 to be used in building its 60-mile electric railway to connect Sisterville, Kidwell, Middlebourne, Shirley and Clarksburg. John F. Shore, Middlebourne, secretary. [E. R. J., March 11, '11.]

**Tyler Traction Company, Clarksburg, W. Va.**—This company will soon begin the construction of its railway to connect Sisterville, Middlebourne and Shirley. It has organized by electing the following officers: H. W. McCoy, president; R. Broadwater, vice-president; W. J. Neuenschwander, treasurer, and John Kinkaid, secretary. [E. R. J., April 22, '11.]

**Hot Springs Street Railway, Thermopolis, Wyo.**—This company advises that it has not decided when it will begin the construction of its 4-mile electric railway in Thermopolis. The company will operate two cars. Capital stock authorized, \$100,000. Officers: S. A. Broadwell, Omaha, Neb., president; C. C. Kindel, Omaha, vice-president; C.

Broadwell, secretary and treasurer, and J. J. Conlon, Thermopolis, superintendent. [E. R. J., Oct. 9, '09.]

#### SHOPS AND BUILDINGS

**Tampa (Fla.) Electric Company.**—Work has been begun and is progressing rapidly by this company on its new carhouse on the Hillsborough River, between Sixth Avenue and Ross Avenue, in Tampa. [E. R. J., April 29, '11.]

**Rockford & Interurban Railway, Rockford, Ill.**—Plans have been completed and bids will soon be asked for by this company to build its new carhouse in Rockford. The structure will be 1-story high, 65 ft. x 240 ft., with a brick bay 33 ft. x 100 ft. The cost is estimated to be about \$20,000. [E. R. J., March 18, '11.]

**Indiana Union Traction Company, Anderson, Ind.**—This company is said to be considering plans to build a new freight station in Bluffton.

**Cincinnati (Ohio) Traction Company.**—McGarvey & Company, Cincinnati, has been awarded the contract by this company to build its new carhouse at Winton Place in Cincinnati. The new buildings will cover nearly two acres of ground.

**Milwaukee Electric Railway & Light Company, Milwaukee, Wis.**—Plans have been completed by this company for a new carhouse on Fortieth Street and Cold Spring Avenue, in Milwaukee. The structure will be two stories high and 180 ft. x 370 ft. The framework will be of structural steel and the walls of brick and concrete construction. The roof will be a concrete slab.

#### POWER HOUSES AND SUBSTATIONS

**Pacific Electric Railway, Los Angeles, Cal.**—This company has closed a contract with the General Electric Company for electrical machinery and equipment, including the following: Four motor-generator sets, each consisting of one M. P. C. 8, 1000-kw, 500 r.p.m., 600-volt, d.c. generator, direct connected to one A. T. I. 12, 1120-kw, 2200-volt, 50-cycle, 3-phase synchronous motor; three motor-generator sets, each to consist of one M. P. C. 6, 600-kw, 750 r.p.m., 600-volt, d.c. generator, direct connected to and mounted on the same base with one I. 8, 900-hp, 750 r. p.m., 2200-volt, 50-cycle, 3-phase induction motor; nine 450-kw, water-cooled transformers and nine 300-kw, water-cooled transformers, all designed for 15,000 volts for primary and 2250 volts secondary.

**Kentucky Traction & Terminal Company, Louisville, Ky.**—This company, which has succeeded the Lexington & Interurban Railways, has purchased two acres of land north of Limestone Street, between Seventh Street and the Belt Railway, in Louisville, adjoining the present power house of the Lexington Railway, upon which it will build a new power house.

**Biddeford & Saco Street Railway, Biddeford, Me.**—It is stated that the deal pending between the Biddeford & Saco Street Railway and the York Light & Heat Company has been consummated, and that the latter will furnish the former with electricity for power as soon as the necessary apparatus can be installed. The railroad will keep its power plant intact for emergency use.

**Twin City Rapid Transit Company, Minneapolis, Minn.**—This company is reported to be purchasing flowage rights at Eagle Rapids, eight miles from Chippewa Falls, with a view to developing 20,000-hp.

**Springfield (Mo.) Traction Company.**—The Federal Light & Traction Company, New York, N. Y., which owns the Springfield Traction Company, is planning to double the capacity and efficiency of its power plant in Springfield. Plans and specifications are being made by L. A. Shattuck and W. A. Haller, of New York.

**Delaware & Hudson Railroad, Albany, N. Y.**—This company has ordered from the General Electric Company one 8000-kw, 2300-volt turbo-generator, one 100-kw, 125-volt turbo-exciter and four 2500-kva, 2300-volt step-up transformers for its Mechanicsville substation.

**Northwestern Pennsylvania Railway, Meadville, Pa.**—This company is installing additional boilers and a feedwater purification system in its power plant in Meadville. C. L. Murray, Meadville, general manager.

# Manufactures & Supplies

## ROLLING STOCK

**Springfield (Mass.) Street Railway** has ordered three closed cars from the Osgood Bradley Car Company.

**Meadville & Cambridge Springs Railway, Meadville, Pa.,** will soon be in the market for new trucks and motors.

**York (Pa.) Railways** have ordered four 26-ft. semi-convertible motor car bodies from The J. G. Brill Company.

**Portland, Eugene & Eastern Railway, Portland, Ore.,** has ordered two Brill 27-G-1 trucks from the American Car Company.

**Worcester (Mass.) Consolidated Street Railway** has ordered fifteen closed cars from the Osgood Bradley Car Company.

**Denver & Intermountain Railroad, Denver, Col.,** has ordered four Brill 27-GE-1 trucks from the American Car Company.

**Montgomery (Ala.) Traction Company** has ordered six Brill 21-E trucks and four Brill 27-G1 trucks from The J. G. Brill Company.

**Woodlawn & Southern Street Railway, Woodlawn, Pa.,** has ordered two 20-ft. closed motor cars and four 33-ft. 9-in. motor cars from the G. C. Kuhlman Car Company.

**Pacific Electric Railway, Los Angeles, Cal.,** has ordered fifty quadruple GE-210, 60-hp railway motor equipments with type M control from the General Electric Company.

**Columbia Railway, Gas & Electric Company, Columbia, S. C.,** has ordered through J. G. White & Company, New York, N. Y., six semi-convertible cars from The J. G. Brill Company.

**St. Joseph Railway, Light & Power Company, St. Joseph, Mo.,** has ordered from the Westinghouse Electric & Manufacturing Company ten No. 307 split-frame interpole railway motors.

**New York & North Shore Traction Company, Roslyn, N. Y.,** has purchased four quadruple GE-88 motor equipments with air brakes and whistles from the General Electric Company.

**Metropolitan Street Railway, Kansas City, Mo.,** has ordered twenty-five quadruple equipments of No. 306 motors with K-35 control from the Westinghouse Electric & Manufacturing Company.

**San Antonio (Tex.) Traction Company** has purchased twenty double equipments of No. 92-A interpole railway motors with type K-28 control from the Westinghouse Electric & Manufacturing Company.

**Erie & Suburban Railway, Erie, Pa.,** has ordered forty Brill 39-E trucks from the G. C. Kuhlman Car Company. The company has also ordered twenty GE-80 two-motor equipments from the General Electric Company.

**Seattle-Everett Traction Company, Bellingham, Wash.,** has ordered a quadruple equipment of No. 304 railway motors with HL non-automatic unit-switch control from the Westinghouse Electric & Manufacturing Company.

**Syracuse (N. Y.) Rapid Transit Railway** has ordered twelve 31-ft. 11-in. semi-convertible pay-as-you-enter cars and twelve Brill 27-F-1 trucks without wheels from the G. C. Kuhlman Car Company. They will be equipped with GE-216 motors.

**Toledo & Indiana Traction Company, Toledo, Ohio,** has ordered from the Westinghouse Electric & Manufacturing Company one Baldwin-Westinghouse 8-4E locomotive equipped with four No. 304-A interpole railway motors and type L-4 control.

**Pittsburgh (Pa.) Railways** has ordered fifty-three quadruple equipments of No. 306-CD box-frame railway motors with type K-43-B control, also an additional 160 motors of the same type, from the Westinghouse Electric & Manufacturing Company.

**Tri-State Railway & Electric Company, East Liverpool, Ohio,** noted in the ELECTRIC RAILWAY JOURNAL of May 20, 1911, as being in the market for several cars, has ordered through J. G. White & Company, New York, N. Y., four open single-truck cars from the Cincinnati Car Company.

**Great Falls & Old Dominion Railroad, Washington, D. C.,** has purchased three quadruple equipments of No. 93-A2 railway motors with HL non-automatic unit-switch control arranged for both ground and metallic return with special change-over switches from the Westinghouse Electric & Manufacturing Company.

**Arkansas Valley Railway, Wichita, Kan.,** reported in the ELECTRIC RAILWAY JOURNAL of April 8, 1911, as having ordered five combination interurban motor cars of the steam-coach type from the St. Louis Car Company, has specified the following details for this equipment:

Seating capacity.....	53	Couplers .....	MCB radial
Weight (car body).....	30,000 lb.	Curtain fixtures....	C. S. Co.
Bolster centers, length..	27 ft.	Curtain material....	Pantasote
Length of body.....	36 ft. 7 in.	Gongs .....	12-in. pedal
Over vestibule.....	45 ft. 3 in.	Hand brakes .....	Peacock
Width over sills.....	9 ft. 3/4 in.	Heaters .....	Cooper
Over all .....	9 ft. 2 in.	Journal boxes .....	MCB
Height, rail to sills....	41 ft. 3/8 in.	Motors .....	4-West. 307
Sill to trolley base....	10 ft. 3 in.	Motors .....	inside hung
Body .....	wood	Sanders .....	St. L.
Interior trim...mahog. & oak		Sash fixtures....	Edwards
Roof .....	monitor	Seats .....	St. L. stationary
Air brakes .....	West.	Trolley .....	Knutson
Axles....	4 1/4-in. journal steel	Trucks .....	St. L.
Cables .....	West.	Varnish .....	Murphy
Car trimmings .....	bronze	Wheels ...	rolled steel 34-in.
Control...single end, type K			

## TRADE NOTES

**Gold Car Heating & Lighting Company, New York, N. Y.,** has elected Ambrose L. O'Shea a director to succeed W. W. Butler.

**McKeen Motor Car Company, Omaha, Neb.,** recently shipped a third 70-ft. gasoline motor car to the Ann Arbor Railroad.

**Penn Steel Castings & Machine Company, Chester, Pa.,** has elected Walter S. Bickley president of the company to succeed the late Mortimer H. Bickley.

**General Vehicle Company, Long Island City, N. Y.,** has purchased a block of fifty lots on Borden Avenue, Long Island City, on which it is rumored the company will erect a branch plant.

**H. A. Hunt** has been appointed Eastern sales agent of the Edgar Allen American Manganese Steel Company, with headquarters at New Castle, Del. This appointment was made to fill a vacancy caused by the resignation of V. W. Mason, Jr.

**Lee Machine Company, New Haven, Conn.,** has been chartered with a capital stock of \$150,000 to manufacture the Lee steam turbine. The incorporators are Henry B. Lee, New London; Winthrop G. Bushnell and Samuel C. Morehouse, New Haven.

**Greenlee Brothers Company, Rockford, Ill.,** has removed its general offices from Chicago to Rockford, Ill., where the factory and accounting departments are located. The Chicago office is in charge of James A. Lounsbury, the vice-president of the company.

**Page & Hill Company, Minneapolis, Minn.,** has appointed William Underwood to take charge of its pole preserving plant at Minnesota Transfer. Mr. Underwood is a graduate of the Forestry School, University of Minnesota and is an expert in wood preservation.

**Philadelphia Locomotive Company, Philadelphia, Pa.,** which is said to be a reorganization of the Baldwin Locomotive Works, has increased its proposed capital from \$40,000,000 to \$50,000,000. Common stock is increased from \$20,000,000 to \$25,000,000, and 7 per cent preferred increased to the same amount.

**Lord Manufacturing Company, New York, N. Y.,** reports the receipt during the last year of some large contracts calling for both American and foreign shipments, and its business has grown in volume to such an extent recently that the company has been compelled to increase the output of its factory by placing orders for new machinery.

**J. G. White & Company, Inc., New York, N. Y.,** gave a dinner at the Hotel Astor during the convention of the

National Electric Light Association in New York in honor of the officials connected with the companies of which J. G. White & Company, Inc., are operating managers, who attended the convention of the association. The dinner was attended by nearly fifty officials of J. G. White & Company, Inc., and of the operating companies, including J. G. White, F. H. Reed, J. H. Pardee, R. B. Marchant, H. S. Collette, W. R. W. Griffin and E. C. Deal.

**Pennsylvania Steel Company, Steelton, Pa.**, has appointed G. S. Vickery superintendent of the frog and switch department of the company. Mr. Vickery has been acting superintendent of that department since Oct. 22, 1910. He has been connected with the Pennsylvania Steel Company in an engineering capacity since 1898, during which time he has been in close touch with the policy which has brought the frog and switch department to its present high efficiency. He is a native of Maine and a graduate of the University of Maine. For four years he was city engineer of Bangor, Maine, and his wide experience in the engineering field makes him well fitted for the position.

**Ackley Brake Company, New York, N. Y.**, announces the formation of a new company to look after the manufacture and sale of Ackley brakes in France and colonies, Spain, Morocco, Tunis, Algiers and Egypt. This new company has been incorporated under the name of Compagnie Française des Freins Ackley, with offices at 62 rue Saint Lazare, Paris. G. S. Albanese, who has been the representative of the Ackley brake interests in the above countries since the introduction of the Ackley brake to the European trade, two years ago, has been made managing director of the new company. Mr. Albanese is an engineer of high standing and of wide acquaintance with tramway officials throughout Europe. This new French company is the third European Ackley company to be established within the past year, the others being the British Ackley Brake Company, of London, and the Deutsche Ackley Bremsen Company, m. b. H., of Berlin. These companies operate under the Ackley patents and control the manufacture and sale of the Ackley brakes in most of the European and North African countries, while the Ackley Brake Company, of New York, controls the manufacturing and sales rights for export to the remaining countries of the world outside of the United States, Canada, Mexico and the Hawaiian Islands. The establishment of the above companies was made imperative by the increasing popularity of the Ackley brakes, so that the demands of the European trade could be more expeditiously supplied.

**Electric Service Supplies Company, Philadelphia, Pa.**, has moved to its new office and factory building at Seventeenth and Cambria Streets, North Philadelphia. The new building takes the place of the old factory at Keokuk, Ia., and the Philadelphia office and warehouse formerly at 1020-24 Filbert Street. There is a siding in the property which connects with the passenger and freight station of the Pennsylvania and Philadelphia & Reading Railroads, which are only five blocks away. The building, which is the first of a group to be erected on the site, is a six-story, monolithic reinforced concrete structure, fireproof in construction and equipped with an automatic sprinkler system. On the first floor are located the receiving and shipping departments and store-room. On the second floor are located the general offices of the company, with the exception of the offices of the factory manager and the shipping department, which are on the fifth and first floors respectively. The remaining four floors are devoted to manufacturing purposes exclusively. On the fifth floor are located the machine shops, factory stock rooms, assembling racks for such specialties as the automotoneer, Garton-Daniels lightning arresters, Keystone portable lamp guards, trailer connectors, trolley pick-ups and others. On this floor space is also set aside for designing and experimental work. The electrical equipment of the building consists of three distinct services, all of which are brought underground to a general meter and distributing board located on the first floor.

#### ADVERTISING LITERATURE

**Electric Storage Battery Company, Philadelphia, Pa.**, has issued a 16-page catalog on its Exide battery and Hycap-Exide battery for electric vehicles.

**Weston Electrical Instrument Company, Newark, N. J.**,

has issued a folder in which is illustrated a complete line of Weston a.c. switchboard indicating instruments.

**National Surface Guard Company, Chicago, Ill.**, has issued two booklets which describe and illustrate its stock guards and the National ratchet track wrench respectively.

**Conduit Machine Company, New York, N. Y.**, is distributing to the trade a small pocket set of wiring formulæ tables, together with other valuable data. The company is also mailing two circulars on its C-M fishing and threading machine.

**Toch Brothers, New York, N. Y.**, have issued a booklet which discusses the merits of cement filler and cement floor paint. It also contains specifications for applying this material, and calls attention to another material known as pigment cement filler.

**Hill Publishing Company, Ltd., London, Eng.**, has issued a new catalog of technical and scientific books on mining, railway, chemical, electrical and other subjects. This company also acts as sole English agent for the McGraw-Hill Book Company, New York, N. Y.

**Stone & Wester Engineering Corporation, Boston, Mass.**, is mailing a booklet which contains views showing the rapid progress made on the two reinforced concrete shop buildings which it erected recently for the General Electric Company at Schenectady, N. Y.

**Q M S Company, Plainfield, N. J.**, is mailing a circular on its car wheel grinding machine. In connection with this circular the company is sending a reprinted page from the *STREET RAILWAY JOURNAL* of Feb. 22, 1908, which describes and illustrates this type of car wheel grinding machine.

**Electric Service Supplies Company, Philadelphia, Pa.**, prints in the May issue of the "Keystone Traveler" an announcement of the merger of the Pay-As-You-Enter Car Corporation and the Pay-Within Car Company into the Prepayment Car Sales Company, also a description of its new factory, office and warehouse building in New Philadelphia.

**Western Electric Company, New York, N. Y.**, has issued Bulletin No. 1080, entitled "Railroad Telephone and Selective Apparatus." It contains fifty-six pages and lists a great variety of apparatus. A 4-page insert is devoted to the Western Electric selector, with photographs of the installations of this apparatus on three of the large trunk line railroads.

**Ohmer Fare Register Company, Dayton, Ohio**, has issued a leaflet which calls attention to the satisfactory record of Ohmer registers on the cars of the Syracuse (N. Y.) Rapid Transit Railway, and to the paper delivered on the subject by J. E. Duffy, superintendent of that company, at a meeting of the New York State Street Railway Association held in Syracuse on March 22, 1911.

**Standard Underground Cable Company, Pittsburgh, Pa.**, has issued a 32-page booklet in which the merits of Colonial copper-clad wire, bare and insulated forms, are discussed. A set of data tables are printed at the end of the booklet. Another booklet issued by the company describes and illustrates Davis open air terminals for protection of outdoor ends of lead-covered underground cables.

#### NEW PUBLICATION

**Motion Study: A Method for Increasing the Efficiency of the Workman.** By Frank B. Gilbreth. New York: The D. Van Nostrand Company. 116 + xxiii pages; illustrated. Price \$2.

This is an exposition of the theory and practice of "efficiency engineering" as applied to bricklaying. After a general discussion the author discusses the variables of the three varying elements concerned in the laying of bricks, namely, the worker, the surroundings and the motion, and then the effect of these variables upon the establishment of an efficiency program. Briefly the principle involves the reductions of the motions made by all employees, but particularly of the highest paid, during their work, with the purpose of increasing their effective output. The book is well illustrated and contains an introductory note by William Kent, editor of *Industrial Engineering*, in which the series of articles composing this book originally appeared.