

# Electric Railway Journal

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### THE CONVENTION ISSUE

For twenty-six years the ELECTRIC RAILWAY JOURNAL has published a special issue just prior to the annual electric railway convention. When this plan was begun the association met at a different city each year, and the pre-convention issue contained a description of the transportation system in that city so as to aid the visiting delegates in their inspection of it. Lately, as the association has found it more convenient to meet in the same place from year to year, the subject discussed has been some topic of special interest at the time. This year it has been considered desirable to summarize the progress made in different departments of electric railway operation during the past few years. In our issues from week to week we have described different installations, but in the present issue an attempt has been made to eliminate the effect of local conditions in each installation and thus leave only the broad underlying principles which point to the direction in which progress is being made. It has been impossible, of course, to include a discussion on all of the departments of electric railway practice or to refer even in those selected for treatment to interesting work done by all companies, but enough have been considered, we believe, to give a good bird's-eye view of the development in the industry. This issue is being mailed to subscribers more than a week in advance of the opening of the convention so that they will receive it at their home address before they leave for Atlantic City.

### THE UPKEEP OF BRIDGES BY ELECTRIC LINES

The article in this issue entitled "Bridges of the Connecticut Company" brings out two very important differences in the bridge practice of steam and electric railways. The steam railroad owns practically all of the bridges, viaducts and similar structures on its right-of-way, and in designing them it usually makes ample allowance

for the probable increase of axle loading, higher speed and the like. The electric railway is obliged to operate chiefly over bridges built by the local municipalities for all kinds of traffic, and even its own bridges are likely to become antiquated sooner than steam railroad bridges because of faster and more radical changes in electric railway standards and operation. In taking over the care of the way structures used by the original companies the Connecticut Company found that many of the bridges were inadequate to carry modern car equipment. In fact, some of the highway bridges had never been designed for electric railway service at all. The rehabilitation and partial replacement of these structures, numbering nearly 400, constitute one of the most extensive improvements ever known in electric railway engineering. But the methods of inspection and the character of the engineers' recommendations are more important to other electric railways than the mere size of the task. These are now available in an article published in this issue, which includes, besides an account of the work, a series of loading diagrams which should help the maintenance-of-way engineers on other roads to keep a better check on this most vital feature of their work.

### THE NEW BERLIN CARHOUSES

The article on the new carhouses in Berlin published elsewhere in this issue will serve to call attention to striking engineering and political differences from American conditions. So far as engineering features are concerned, it may be said with perfect frankness that in the United States it is not considered best practice to build non-sprinkler carhouses with exposed roof trusses and without fireproof partitions. No recent American carhouse has anything like 200 cars stored as one risk. Instead of the American limitation of 20,000 sq. ft., which in one instance was granted by the fire underwriters for the minimum rate, the Berlin carhouses actually have open areas as great as 76,855 sq. ft. The explanation of this construction is to be found in the better discipline of employees which naturally obtains in a country where former soldiers receive the preference in railway employment. In Germany a carhouse fire from such a fertile cause as negligent accumulation of rubbish and oily waste is almost inconceivable. One may say that what these carhouses lack in fire-restricting construction appears to be balanced by closer superintendence of fire-breeding conditions. Furthermore, this superintendence is greatly aided by the liberal natural lighting of the buildings, which would make any neglect visible at once, and by the care given to the fire-fighting equipment. The utilities rooms include a sub-station, but all the transportation business is conducted in a nearby building, in which living apartments are also provided for the families of the carhouse supervisor and other petty officers.



### MAYOR JOST'S FRANCHISE

Arduous and prolonged labors on the part of Mayor Jost of Kansas City and representatives of the Metropolitan Street Railway have culminated in a revised franchise that is soon to be submitted to the Kansas City Council for approval. As it now stands, the franchise is essentially a Jost instrument. Almost every disputed point that has arisen in the several conferences has been settled practically in accordance with the views of the Mayor and his advisers.

It is contended by Mayor Jost and his representatives that the revised instrument is the last word in franchise making, and from the viewpoint that every possible advantage to the administration has been gained without any substantial concessions to the company, this is true. The main sections, providing for the control of the company, the reduction of debt by application of the company's surplus earnings, the option to buy the property out of surplus, to reduce fares or to make extensions, and then, too, the requirement that the company must provide good service and extensions without making the purchase an impossibility—all of these compose a franchise which from the city's point of view is an advance over the previous one. These points are only a few of the evidences that a casual reader will find indicating that the main object of the draft is to extract every ounce of benefit for the city and leave the company merely to raise money for the refinancing with greatly reduced authority in the management of the property.

One of the most interesting sections of the new ordinance is that which deals with the method of control of the company. The position of general manager is to be abolished and the conduct of the business is placed in the hands of two members, one named by the company and one by the Mayor. Any differences between these two are to be submitted to and summarily determined by a third person selected as an arbiter by the Kansas City Court of Appeals. There will be a board of eleven directors, three for Kansas City, Mo., two for Kansas City, Kan., and six for the company. The board of control has the ordinary administrative duties and powers, but in matters of extensions, new lines, re-routing and schedules its action must be approved by a majority of the three Kansas City, Mo., directors. Inasmuch as it is evident that under the State law and city charter the City Council has the supervision of these points, in reality the board of control and the directors are only advisory to the Council and the latter has the determinative word in regard to extensions and improvements to be made within a given time.

Under the terms of the proposed franchise the city virtually guarantees the company a return of 6 per cent on the capital value of \$30,000,000. The surplus earnings up to \$7,500,000 are to be expended for extensions and betterments before any division is made between the city and the company, by which time the actual physical value of the property will be equal to the capital value. After this the surplus earnings are to be divided one-third to the company and two-thirds to the city. When the city has reduced the capital value to half the physical value, it may take over the property. It was insisted by the city, however, that

its portion of the surplus should be applicable to the reduction of fares and the making of extensions as well as to amortizing the debt of the company. This provision places it within the power of the people at a special election to hasten the time of municipal ownership or else open up new city districts and lower the fares. If the city's surplus is used for extensions, however, city ownership is deferred only through this use of money that might be applied to capital reduction, for none of such extensions is to increase the capital value on which the company draws interest.

The forfeiture clause in the proposed ordinance, while not so severe as some others, is sufficiently formidable. The city officials happily realized that a forfeiture clause driving the company from the streets and depriving the public of its service was equivalent to no forfeiture at all, and yet they desired an effective remedy that would not amount to confiscation of the investment of an innocent stockholder or bondholder because of an error of judgment on the part of the management of the company. As finally decided upon, the sequestration or tying up of the company's money, pending court action in regard to some delinquency, serves to inflict a penalty at once instead of waiting for the result of several years' litigation. This places the entire incubus on the company, for the city, if action against the company is found unjustifiable, suffers nothing except the release of the company's accrued earnings.

One praiseworthy move on the part of the conferees is the introduction of consistency into the relations between the Metropolitan system and interurban lines entering the city. Heretofore some interurban lines have desired the city company to operate their cars, to be responsible for them within the city limits and to take the greater proportion of the fare and pay damage suits. Other lines desired to operate their cars themselves and to be responsible accordingly. Under the proposed arrangement all responsibility is placed on the shoulders of the Metropolitan company and the board of control governs the routings, fares and transfers of the entering lines and may make rulings concerning the intrusion of local passengers on through cars. The general result of this settlement is a classification and standardization of existing practices, and it should be the means of encouraging interurban traffic.

The prime consideration of the proposed franchise, according to a special clause inserted by the revisers, is first-class modern service, and to this all other considerations are to be sacrificed if sacrifice becomes necessary. Not even the 6 per cent guarantee to the company, its right to participate in the surplus earnings or the city's right to share therein is to be of prior moment. This promise, when considered in connection with the minimum of 16 per cent fixed for maintenance, repairs and depreciation and the definite amounts agreed upon to be raised and spent for improvements each year from 1914 to 1943, ought to appease those who have been bewailing the lack of service. The struggle, however, is by no means over. Complications are liable to arise through the declaration of the local council of labor unions that all members will be instructed to vote against the franchise unless the Metropolitan agrees to recognize the unions. The revised plan has yet to be approved by representatives of the bankers, bondholders and



stockholders, by the Council, the Public Service Commission, Judge Hook of the Court of Appeals and the voters. Moreover, the entire question has yet to be settled with the Council and voters of Kansas City, Kan. Whether this ordinance will ultimately run the gauntlet more successfully than did the 1909 franchise remains to be seen, but it is quite apparent that its path will be a rocky one.

#### PROGRESS IN ELECTRIC RAILWAY OPERATION

That statistics may be made to prove nearly anything desired by the compiler is unfortunately true in a good many cases. Yet it cannot be denied that a summary of past results is invariably productive of a great deal of valuable information, and in the Convention Section of this issue the outline of progress in different branches of the electric railway field gives definite expression to tendencies of which the existence has been largely a matter of surmise. In the chapter on track construction the practically universal use of concrete is obvious, as might be expected, for out of a list of twenty representative cities of which track sections are shown there is only one, Houston, that does not utilize it in some manner in the construction of the permanent way, and even in this city part of the track is laid upon a solid concrete foundation.

Of the twenty roads, however, ten use concrete above the tie or prevent it from extending below the lower edge so that the support is really afforded by the ballast which is tamped underneath. Here is, indeed, a demonstration of the fact that concrete is regarded fully as much for its ability to support the paving and waterproof the foundation and thus limit the frost damage to the track alignment as for its ballasting qualities. Only six of the remaining ten roads use concrete below the tie as a standard construction, two using both forms of construction, one using either an all-concrete or an all-gravel construction and one using a steel tie under which no tamping is done.

In the chapter on power generation and distribution the keynote is the evidence that great changes in substation equipment are under way, taking the form of remarkable decreases in the sizes of rotary converters. Substation equipment has been, of course, the weak point in the chain of power supply. Decreased size and cost for the same output and improved design for rotaries constitute steps which have been needed badly, but it is by no means certain that the improvements have not arrived too late, as the mercury-arc rectifier is looming up to-day as a possible rival. The growing use of a frequency of sixty cycles for primary power, as pointed out in this chapter, will cause an increase in purchased current, for with the commercial development of the commutating-pole rotary the gap has been bridged between the sixty-cycle lighting plants and the railway substation, heretofore operating almost exclusively on twenty-five cycles. In this chapter the latest published figures on storage battery operation are of interest, as they indicate the difficulty of getting cheap power out of a large floating battery.

In the matter of city car design the spectacular center-entrance cars of the year 1912 have left a mark, but the majority of the cars ordered during 1913 have been of the end-entrance type, and the use of steel in the construction and the arrangement of prepayment platforms have

again come to the front as features of paramount interest. The composite designs of steel and wood appear to be losing ground, and as no composite design has been of exceptionally low weight this would seem to be eminently logical, weight being considered to-day of vital importance.

In repair shop practice the evident trend is toward a departmental organization, for in practically every reference cited in the chapter on this subject the elimination of the general repair shop and all-around workman is indicated. Even in the reorganization of old properties the feeling is strongly evidenced that much can be gained by localizing all work of a certain character so that specialists may be developed and expert supervision concentrated. This seems to be as far as any electric railway wishes to go into the comparatively recent and possibly dangerous doctrines of efficiency engineering. Indeed, an excess of system is apparently not considered desirable anywhere, as indicated in the chapter on fare accounting.

The chapter on the transportation of freight demonstrates the fact that but few electric railways are making the most of their opportunities in this line of business. There are, it is true, several obstacles opposed to the building up of a profitable freight department, prominent among which is the incomprehensible objection of many communities to the hauling of freight over the city tracks even at night. Yet the fact that a number of roads have succeeded in building up a highly remunerative freight and express business is an indication of the possibilities for others, the field lying rather in quick deliveries and high rates than in bulk freight hauled in trains.

The subject of automatic block signaling is one which is so new in the electric railway field and at the same time is so constantly being affected by improvements that an outline of past installations which were of importance in the development is quite likely to have to be rewritten at any time. But it is possible to-day to divide existing methods of signaling into seven different forms, of which one is a dispatcher's signal, four are of the trolley contact type and two are controlled by continuous track circuits, one using the so-called preliminaries and one eliminating them. In one way the presence of such widely different schemes is a distinct advantage as it affords an opportunity for the selection of a system in accordance with the traffic requirements, the cost ranging all the way from \$200 per mile up to \$2,000.

In the chapter on self-propelled cars the most striking point is afforded by the diverse lines of development which have been taken by the storage battery car here and abroad. In Germany almost all long-distance operation is carried out with accumulator cars, while in the United States gasoline and gas-electric cars are most common for steam railroad conditions. This may be largely accounted for by the fact that in a densely settled country like Germany sources of energy for charging the cars are usually within moderate distances of one another so that the batteries are of reasonable capacity. In this country, however, power supplies are scarce in most of the sparsely settled territories where self-propelled cars are desired. Consequently, American storage battery cars have found their widest application in or near cities, and by far the greater number are small enough for possible one-man operation.



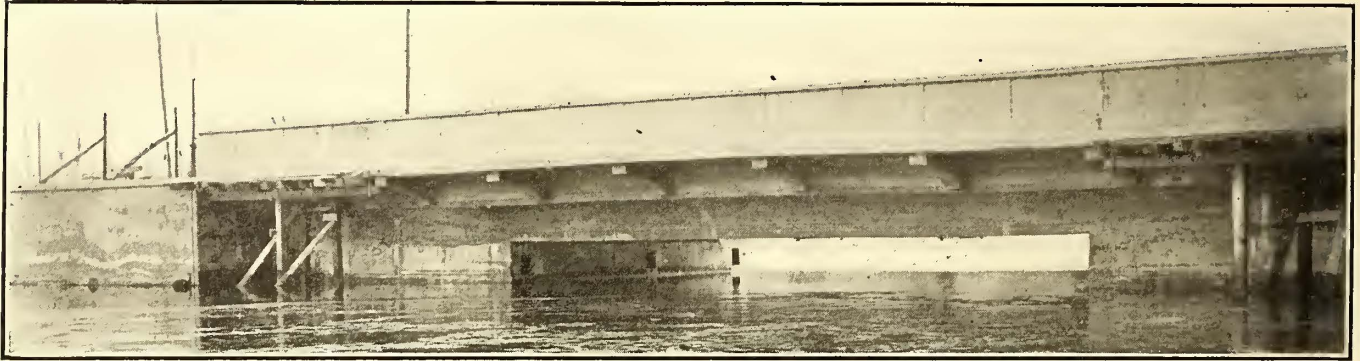
# Bridges of the Connecticut Company

Views and Brief Descriptions of a Number of Bridge Structures Are Presented, Together with an Account of an Extended Bridge Investigation Which Includes Approximate Methods of Determining Loading

The Connecticut Company now maintains 397 bridges, arches and like structures of 10-ft. span or more. Some of these structures are the property of the company, but others are highway bridges which are maintained jointly with the municipality as provided by statute. The variety of these

pany's method of reserving an even 100 to designate the bridges, arches, viaducts, etc., of each division.

In most cases the highway bridges are designed by the municipalities, their work being subject to the company's approval on engineering considerations only. So far as

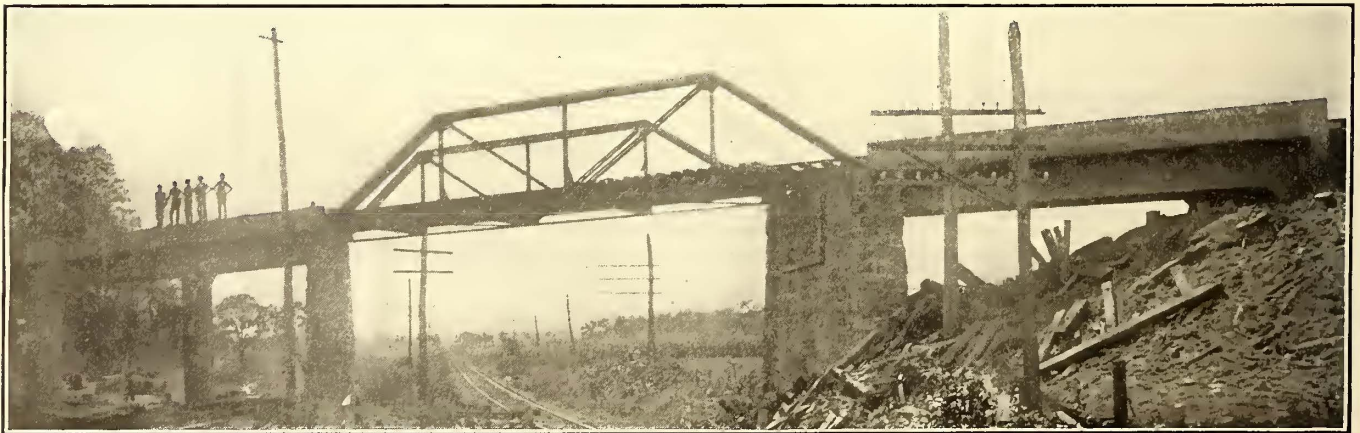


Connecticut Way—Reinforced Concrete Bridge with Cantilevered Sides Built Across Lake Whitney, New Haven. Without Disturbing the Abutments of the Original Bridge

structures on a single division will appear from the following partial record of the New Haven division:

PARTIAL RECORD OF BRIDGES MAINTAINED ON NEW HAVEN DIVISION No. 2			
Name or Location	Length	Type	
416—East Chapel Street, Belle Dock Branch Railroad.	52 ft. 0 in.	Pony plate girders—highway.	
417—Chapel Street, over railroad cut.	Three-span	Three centered reinforced concrete arches—highway.	
418—Water Street, over railroad.	166 ft. 6 in.	Through-pin subdivided Pratt truss—highway.	
419—Forbes Avenue, over Mill River.	539 ft. 0 in.	Draw; pin-connected through Whipple truss—highway.	
420—Oyster River.	33 ft. 6 in.	20-in. I-beams—railway.	
423—Kimberly Avenue, over West River, draw.	193 ft. 0 in.	Draw; two-leaf rolling lift—highway.	

the Connecticut Company's bridges are concerned, many of its I-beam structures have been replaced with reinforced concrete slabs, the reinforcement consisting either of old rails or plain rods. For culverts concrete is used up to 6-ft. spans. Reinforced concrete and the American Ingot Iron Company's malleable-iron culverts are also employed. No attempt has been made to standardize bridges, one reason being that quite a number are old steam railroad structures assigned to the Connecticut Company by the New Haven Railroad and of more than ample strength for electric railway service. However, the form of floor shown in an accompanying drawing is standard for any deck or through



Connecticut Way—New Concrete Approaches Which Replace Timber at Crossing Over Central Vermont Railroad Between Norwich and Willimantic

424—Kimberly Avenue, over West River.	75 ft. 4 in.	Three-bay trestle with concrete abutments—highway.
425—Howard and Kimberly Avenues.	67 ft. 0 in.	54-in. and 36-in. deck girders, two spans, 100-ft. highway.
429—Derby Avenue, over outlet of Malby Lakes.	10 ft. 0 in.	Semicircular rubble arch—highway.
432—Whalley Avenue, over Rifle Range Brook.	13 ft. 1 in.	Stone-arch culvert—highway.

It will be noted from the foregoing list that each structure has a number in the 400's, in accordance with the com-

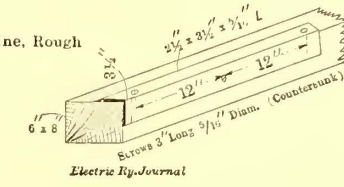
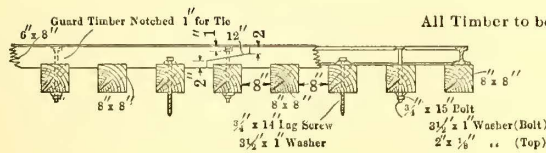
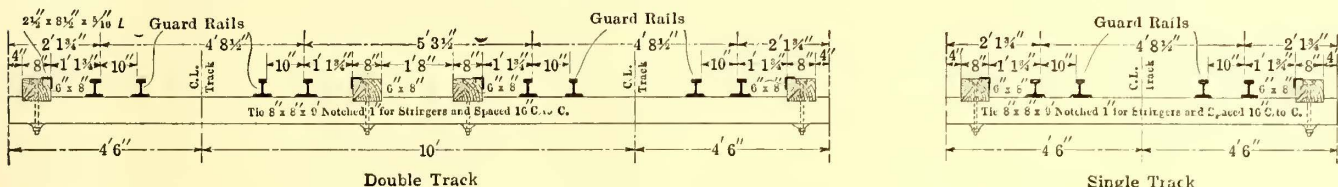
pany's method of reserving an even 100 to designate the bridges, arches, viaducts, etc., of each division.

bridge with open-floor construction. The ties are spaced 16 in. on centers. On all new non-highway bridges and also on some of the older ones railed walks have been provided for the use of trackmen and for the convenience of passengers in stalled cars. These footpaths also eliminate accidents to pedestrians. Conspicuous warning signs are erected so that trespassers who cross the bridge do so knowingly at their own risk. The approaches also have cattle guards.



The illustrations of a four-span (53 ft.-55 ft.-41 ft.-45 ft.) bridge over a brook and the tracks of the Central New England Railroad show a structure where the walkway on each side of the bridge is carried on the extended third

levers. The installation of a new floor jointly by the city and the company in the bridge at Norwich is illustrated on page 640. This bridge is of the lenticular truss type, 144 ft. long over all. Both the stringers and the floor beams

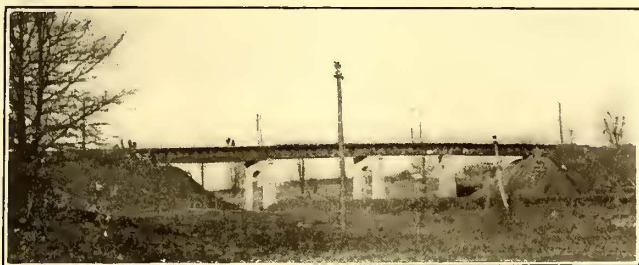


Connecticut Way—Standard Floor System for Bridges and Trestles

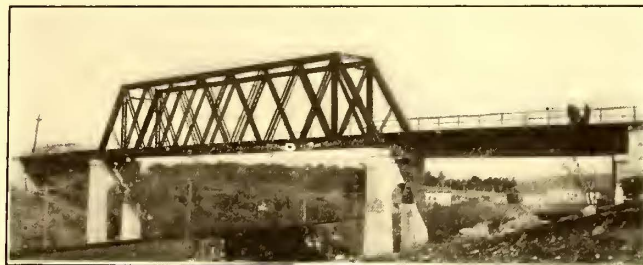
ties. Another bridge with railroad walks is the three-span (75 ft.-150 ft.-75 ft.) bridge located at Stafford Springs over the Central Vermont Railway tracks on the Rockville-Stafford Springs division. This bridge, which was built

were renewed. The floor of this bridge is paved with asphalt.

The bridges are maintained entirely from the office of the civil engineer. At this date no regular inspection



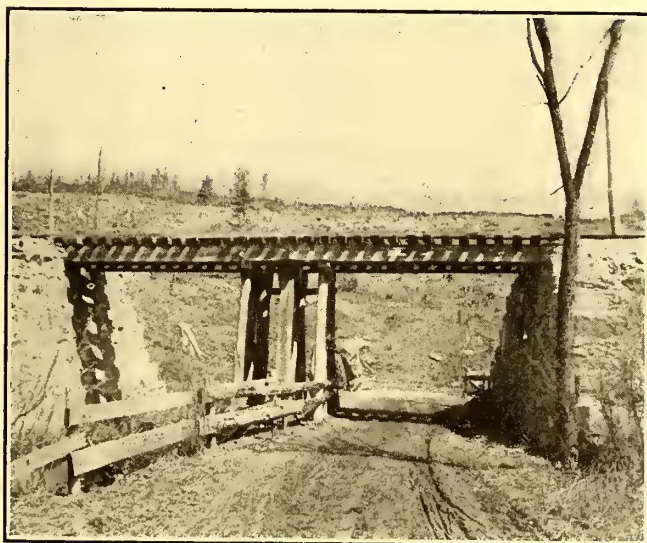
Connecticut Way—Four-Span Bridge with Walk Carried on Extended Third Ties on Each Side of the Bridge



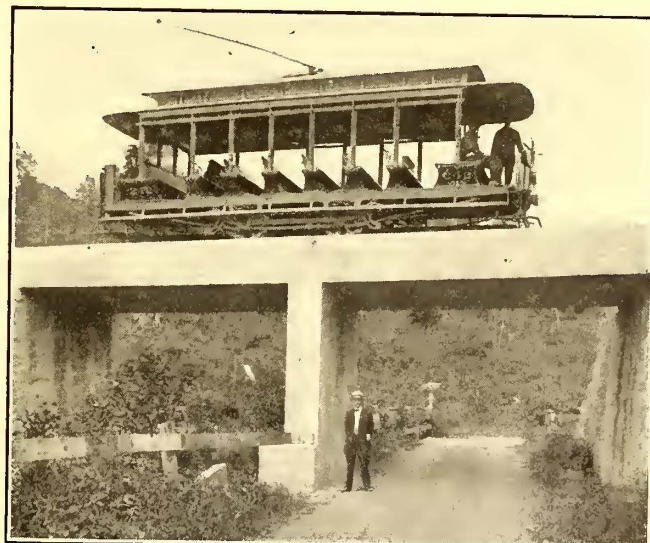
Connecticut Way—Footpath Bridge Over Central Vermont Tracks at Stafford Springs

in 1907, has concrete abutments and piers. Other illustrations show locations where bridges have been rebuilt, enlarged or strengthened. The view on page 638 shows a new bridge built over Lake Whitney, New Haven, of which the

periods have been fixed owing to the recent general overhauling of all bridges as hereinafter mentioned. Bridge work is let by contract on a cost plus percentage basis almost entirely. It is carried out by the company's forces



Connecticut Way—Old Highway and Brook Crossing North of Ayer's Gap Between Norwich and Willimantic



Connecticut Way—The New Reinforced Concrete Crossing Which Has Replaced Old Structure North of Ayer's Gap

old abutments were retained. The change consisted in the replacement of a through-plate girder with a concrete girder and the flaring out of the deck to obtain a wider floor. The cars are run directly over the abutments while pedestrian and highway traffic is carried on the canti-

only when items like timber work, etc., can be handled by local shop forces.

BRIDGE RECORDS

The history of each bridge is kept in a numbered loose-leaf book giving the location, type, length, substructure,



clear spans, number of spans, etc., with sketches referring to particular features. Primarily these records are based upon an extended inspection of all bridge structures which was made in 1907 and 1908 by Herbert C. Keith, a bridge expert of New York. When Mr. Keith made the preliminary inspection the bridges were divided into several classes as follows: those requiring immediate attention, those to receive attention soon, those where changes were desirable and those which required change only to enable them to carry heavier cars. The company's intention was that old bridges should be rebuilt and that new bridges should be erected for a maximum concentrated live load of 50 tons on two trucks of 5-ft. wheelbase placed 25-ft. centers. The company's standard car weights are 50 tons, 36.4 tons, 26 tons and 18.3 tons, the last for a single-truck car of 6-ft. wheelbase.

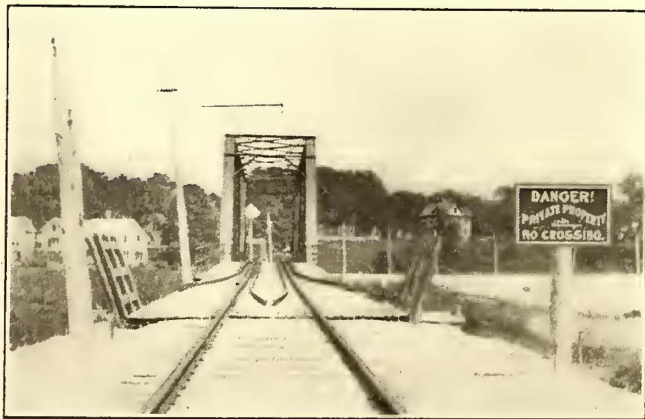
The preliminary report was followed by more detailed reports of each location, giving the data on which the



Connecticut Way—Concrete Girder and Slab-Paneled Side Bridge Which Replaced Pratt Truss and Trestle Structure Between New Haven and Cheshire

condensed loose-leaf record book was based, except that the original reports also contained remarks and recommendations. Next a detailed report on each bridge was made upon which the investigator showed the ratio of the stresses produced by the four standard weights of cars as compared with the standards of the Massachusetts Railroad Commissioners. Detailed computations were made for the lighter cars only when the heavier cars would cause unit stresses greater than would be permitted by the Massachusetts specification.

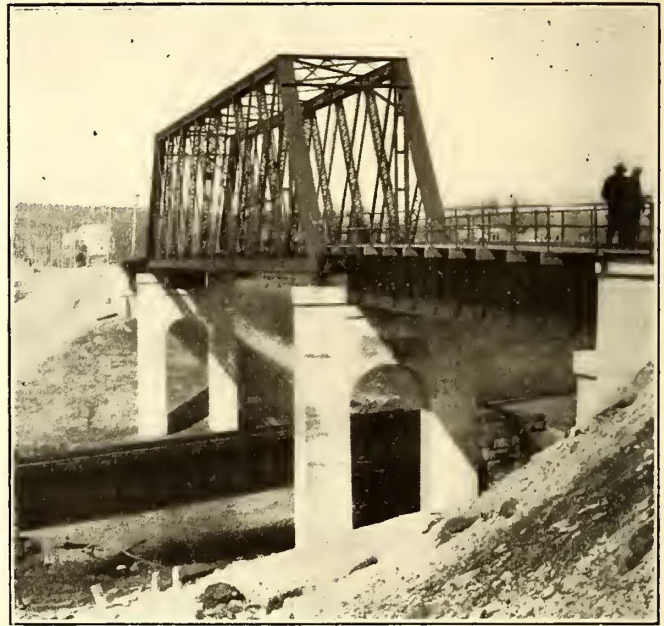
As a result of the "immediate attention" report, many repairs were made before the detailed reports were received. Beginning with the autumn of 1911, another in-



Connecticut Way—Standard Bridge Approach, Showing Cattle Guard, Warning Sign, Footpaths, Etc.

spection was made by Mr. Keith to cover only the more complex structures and those which apparently were not absolutely satisfactory for the heaviest loadings. This report eliminated the simpler structures which had already been recorded. It also eliminated those structures that were known to be satisfactory for the maximum loading. The

middle class included somewhere from seventy-five to 100 bridges. On these a final report was made in which the ratios were worked out not for each weight of car but for the maximum permissible weight of a car with the same wheelbase as the standard car of the Massachusetts Railroad Commission, which weighs 50 tons and differs from

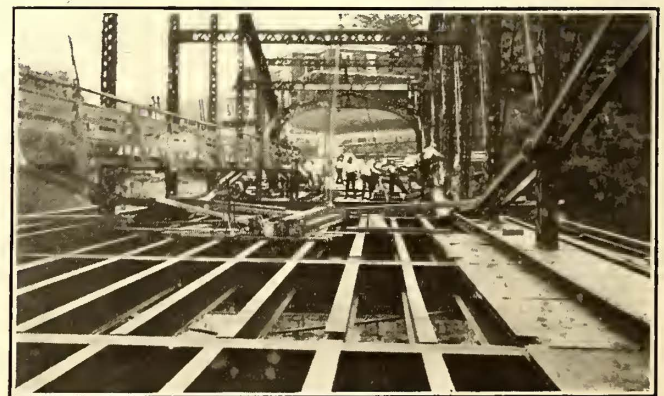


Connecticut Way—Three-Span Bridge Over Central Vermont Tracks and Willimantic River at Stafford Springs

the Connecticut Company's car only in having a truck center distance of 20 ft. instead of 25 ft.

#### METHOD OF INSPECTION

The course followed by the consulting bridge engineer of the Connecticut Company will best be understood by citing two typical structures in the Waterbury district, one being No. 1004, a straight railway bridge, and the other No. 1025, a highway bridge. In 1908 Mr. Keith presented a report on the bridges of the Waterbury district under the classification of "immediate attention," "soon" and "desirable," and noting that the bridges were intended for 36.4-ton and 50-ton cars. The list was accompanied by a series of sheets giving the type, substructure, superstructure,



Connecticut Way—Rebuilding the Floor of Laurel Hill Bridge, Norwich

floor and other details of each bridge with recommendations as to immediate changes to fit the bridge for desired weights of cars. Reports of the two bridges selected, one of straight railway and the other of highway type, are given on the opposite page. The second report, made in 1911, is also presented.



FIRST REPORT ON BRIDGE NO. 1004. 1908

LOCATION  
Over Northampton division New York, New Haven & Hartford Railroad and driveway and brook, one-half mile west of Scott's Junction, in town of Cheshire. Pole C-315. No. 1004.

TYPE  
Two spans deck girders. Railway. One track. Right ahead, 3:10.

CLEAR SPAN  
Two at 58 ft. 4 in.

LENGTH  
Two at 62 ft., set 2 in. open at center = 124 ft. 2 in.

SUBSTRUCTURE  
Concrete abutments and pier. Abutments built for double track except parapets; pier for single track. Good.

SUPERSTRUCTURE  
Girders, 6-ft. o.c.; 54-in. webs; eleven panels top and bottom laterals, staggered; sway frames at each end and third panel points. Scant provision for expansion in setting the stone bolts; girders would fit the masonry better if 2 in. or 3 in. further west (up hill). A little sandy gravel on bridge seats has caused paint to be rusted off somewhat from bottom of girders; not bad yet.

FLOOR  
Hard-pine ties, 6-in. x 8-in., planed, with bolts through flange angles of girders: Good. Hard-pine guard timbers, 6-in. x 8-in., planed, lined with angles; Good. Inside guard rails. Sidewalks of 2-in. hard-pine planking from guard timbers to tight board fences 5 ft. high, 14 ft. 10 in. apart: Good.

REMARKS AND RECOMMENDATIONS  
Clean dirt from bridge seats.

FIRST REPORT ON BRIDGE NO. 1025. 1908

LOCATION  
Bank Street over Naugatuck River at Waterbury. No. 1025.

TYPE  
Through lenticular pin truss with outside sidewalks. 50-ft. highway. One track, 1 in. to 2 in. west of center line bridge. Left ahead, 2:10.

CLEAR SPAN  
169 ft. 6 in.

LENGTH  
172 ft. 9 1/2 in.

SUBSTRUCTURE  
Boulder rubble in mortar. Mortar gone from joints for small area in east abutment. Otherwise Good.

SUPERSTRUCTURE  
(This part of original report described the construction of the bridge.)  
End posts at both ends S. truss and W. end N. truss have lost about 1/16 in. thickness from cover plate and outer web; W. end S. truss has L broken from inner web for 1 ft. length about 3 ft. above floor; L 4 and L 5 at W. end S. truss more than 1/16 in. lost from outside pin plate; at L 5 E. and S. truss loop hanger for floor beam has lost 1/16 in. on top (over pin). Floor beams and stringers show surface rust and paint is nearly all gone, but no depth of corrosion.

FLOOR  
No special support for track, but rails rest on 5-in. x 8-in. hard-pine timbers laid transversely from center to each curb, 20 in. o.c., these timbers being laid flat and cut down to 3 3/4 in. thick for the rails. On these timbers is laid a floor of 3-in. hard-pine plank, laid longitudinally for 8 ft. width at track and diagonally outside of this strip; Good. Sidewalk planking 2 in. on five stringers, 2 in. x 12 in. No guards.

REMARKS AND RECOMMENDATIONS  
I-beams for stringers are extremely light for carrying the track, also very shallow for the span, causing excessive deflection. Should be strengthened. (Apparently rest of bridge much larger capacity, but this can be determined only by calculation.)

REPORT ON BRIDGE NO. 1004. 1911

LOCATION  
Over Northampton division, New York, New Haven & Hartford Railroad, one-half mile west of Scott's Junction, in town of Cheshire. No. 1004.

TYPE  
Two spans deck girders. Railway. One track, within 1/2 in. o.c., with girders. Right ahead, 3:10. Level: steep up grade east of 250 ft. or 300 ft. from bridge.

CLEAR SPAN  
Two at 58 ft. 4 in.

LENGTH  
Two at 62 ft., set 2 in. open at pier = 124 ft. 2 in.

SUBSTRUCTURE  
Abutments and pier of concrete. Condition, Good, except surface scaled in few spots, especially lower part of pier. Base at rail, 29 ft. 11 in. to passway. Base of rail, 34 ft. to brook, 1 1/2 ft. deep. Base of rail, 27 ft. 4 in. to base of low rail (4-ft. elevation). New York, New Haven & Hartford Railroad has 5-in. rails. Switch to turnout for double track, 129 ft. west of bridge.

SUPERSTRUCTURE  
54-in. plate girders, 6-ft. o.c., with eleven panels of top laterals, eleven panels of bottom laterals, and four sway frames in each span. Condition, Good, except not quite perfect bearings of shoes on masonry at east abutment for north girder, and pier for south girders of both spans. Slight rust through paint. Strength, ample for 50-ton car; permits 88-ton car.

FLOOR  
Ties: 8-in. x 6-in. x 9-ft. 1-in. hard pine, 14-in. o.c., not dapped, hooked through outer top flange angle of girders at third ties; eight ties Poor (five together over railroad track). Guard timbers: 8-in. x 6-in. hard pine, dapped to 5 in., bolted to third ties, and lined with 2 1/2-in. x 6-in. angles. 30 per cent Poor. 4-in. guard rails 8 in. from 5 1/2-in. main rails, spiked to every tie, and well spliced on bridge and to east but west of bridge only two bolts in 6-bolt splices. Ends brought together at center line without point blocks, at 43 ft. east and 159 ft. west of bridge. West of bridge, ballast filled in to top of guard rails. Fences: At 7 ft. 5 in. each side of center-line track is tight board fence, from 6 in. to 5 ft. above base of rail, with posts and braces 7 ft. o.c. on sidewalk timber; Good. Planking: Between guard timbers and fence on each side is a 2-in. plank walk carried by 6-in x 6-in. x 8-ft. 10-in timbers between ties, from 1 ft. 4 in. to 10 ft. 2 in. from center line. These timbers hooked under guard rails, and bolted to guard timbers.

REMARKS AND RECOMMENDATIONS  
Renew rotten ties (at least the five over railroad).

REPORT ON BRIDGE NO. 1025. 1911

LOCATION  
Bank Street over Naugatuck River at Waterbury, No. 1025.

TYPE  
Through pin-connected lenticular trusses. 49 ft. highway. One track, varying 3/4 in. to 1 1/4 in. east of center line between trusses. Left ahead, 0.18:1. Steep down grade south from bridge for 200 ft., slight down

grade, north from bridge for 100 ft. 70-deg. ± curve to east from 19 ft. to 46 ft. south of bridge, thence tangent for 98 ft., and thence 33 ft. radius curve to west for 23 ft. 50-deg. ± curve to west for 28 ft. north of bridge.

CLEAR SPAN  
169 ft. 6 in.

LENGTH  
174 ft. 4 in.

SUBSTRUCTURE  
Abutments of field-stone rubble (large stone) laid in mortar. Sewer passes through each abutment just above water level. Condition, Good. Base of rail, 17 ft. 6 in. to water 3 ft. deep. Midland and Naugatuck division New York, New Haven & Hartford Railroad cross overhead 235 ± ft. south of bridge. Switch and frog for double track at 28 ft. and 68 ft. north of bridge (center line of double track ranges to and tangent with center line single track at switch. Tracks 10 ft. 0 in. o.c.).

SUPERSTRUCTURE  
(This part of original report described the construction of the bridge.)  
Condition: End posts of trusses have lost about 1/16 in. from thickness of cover and outer web, at both ends of east truss and south end of west truss, at and just above sidewalk. South end post of east truss has angle broken away from inner web, probably by hub of wheel. Slight loss from some other members of trusses. Six floor beams nearest mid-span have lost 1/16 in. thickness from horizontal legs of top flange angles. Stringers at track nearly full section. Strength: Stringers not permissible for 50-ton car, permits 40-ton car; floor beams, not permissible for 50-ton car and 100 lb. per sq. ft. on roadway and sidewalk; permits 38-ton car and 100 lb. per sq. ft., permissible for 50-ton car alone, permits 53-ton car alone; trusses, not permissible for 50-ton car, and 100 lb. per sq. ft. on roadway and sidewalk, permits 46-ton car and 100 lb. sq. ft.; ample for 50-ton car alone, permits 128-ton car alone.

FLOOR  
Ties: 8 in. x 5 in. to 9 in. x 5 in. hard-pine cross timbers, from channel stringer at center line to truss each side, resting on all intermediate stringers. 19 in. ± o. c., and dapped on top to 4 in. for rails. Generally Good, but some decay. Guard timbers: None. Guard rails: None; lip guard on west rail for 7 ft. on bridge at north end and thence north to switch. Planking: At track, 3 in. hard-pine planking laid longitudinally. For highway each side, 3 in. hard-pine planking laid at 45 deg. Sidewalks have 2 in. hard-pine planking laid transversely on five stringers of 2-in. x 12-in. spruce.

REMARKS AND RECOMMENDATIONS  
Limit load to 40-ton car, or strengthen bridge.

The reports were accompanied by an analysis of conditions in each district. The Waterbury district, for example, had the following discussion:

"The stresses in these bridges are figured for a 50-ton car on each track with a wheelbase

25,000 lb.      25,000 lb.      25,000 lb.      25,000 lb.  
O 5 ft. 0 in.   O 15 ft. 0 in.   O 5 ft. 0 in.   O

and on highway bridges a live load of 100 lb. per sq. foot outside of a line 4 ft. 6 in. from center of track.

"The ratios of these stresses to those permitted by the 1908 specifications of the Massachusetts Railroad Commissioners for the design of new bridges are added. In case these actual stresses exceed those allowed by the specifications, the stresses with a 36.4-ton car with a wheelbase

18,200 lb.      18,200 lb.      18,200 lb.      18,200 lb.  
O 4 ft. 6 in.   O 17 ft. 8 in.   O 4 ft. 6 in.   O

are added with the ratio of these stresses to those specified.

"All bridges that are not ample for a 36.4-ton car are figured for a 26-ton car with a wheelbase

13,000 lb.      13,000 lb.      13,000 lb.      13,000 lb.  
O 4 ft. 6 in.   O 14 ft. 10 in.   O 4 ft. 6 in.   O

and also for an 18.3-ton single-truck car with a wheelbase

18,300 lb.      18,300 lb.  
O 6 ft. 6 in.   O

"All highway bridges that are not ample for car and 100 lb. per sq. ft. on roadway and sidewalk are figured for car only. Bridges with double track, if not ample for a car on each track, are also figured for a car on one track.

"Generally an excess of 40 per cent above the specifications (or a ratio of 1.40) is permissible for sound timber or iron or steel in good condition. Thoroughly sound timber may be used temporarily where the ratio does not exceed 2.00.

"Where the specifications are too exacting for the consideration of old structures, the figures below are modified to fit the conditions.

"Ratios inclosed in parentheses in the summary allow for reduced strength due to decay or corrosion.

"Generally an excess of 100 per cent above the specified stresses may be permitted for rivet details to correspond with 40 per cent excess in sections. In special cases larger ratios are permissible as noted.

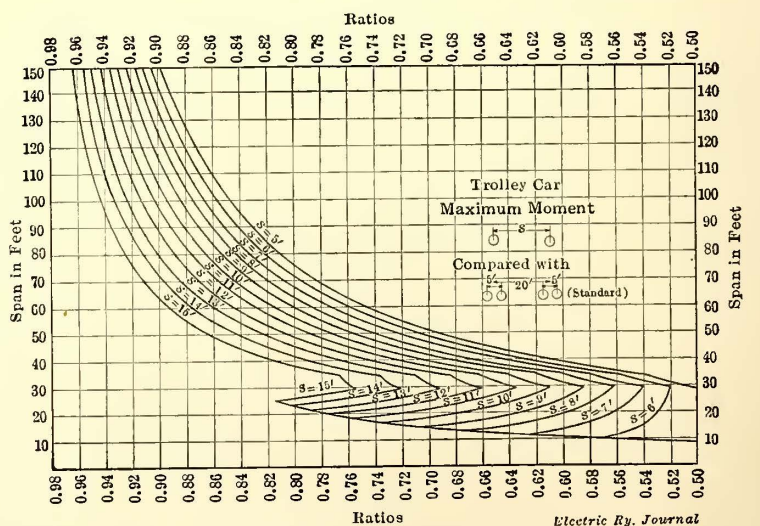
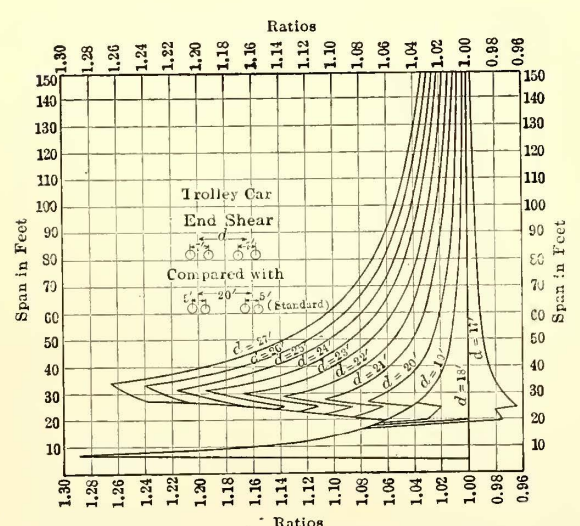
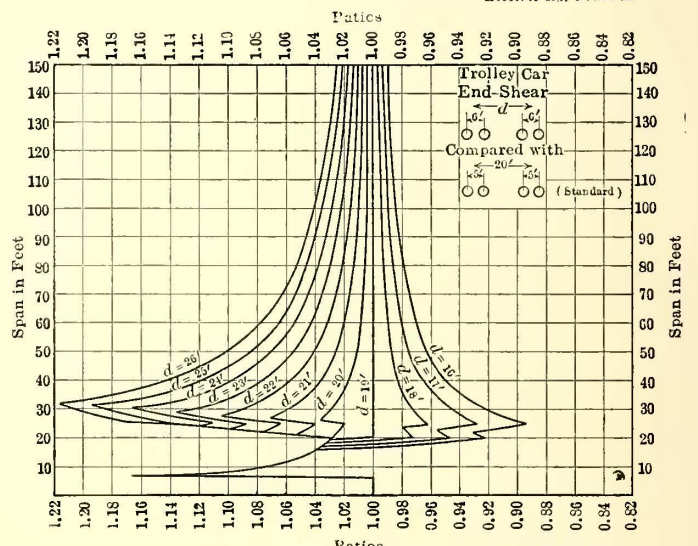
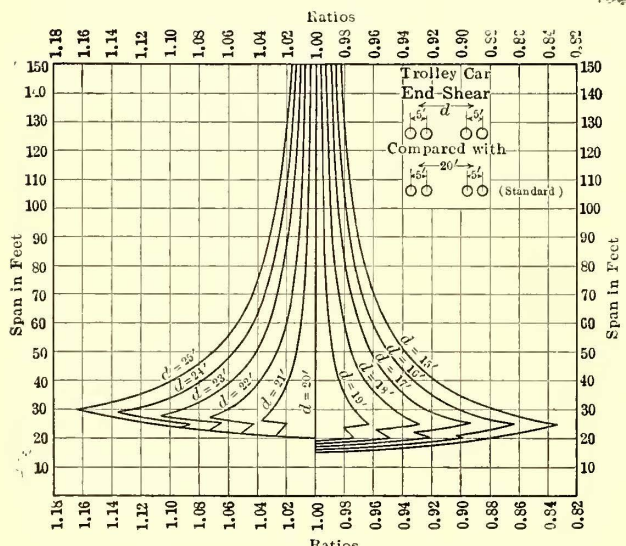
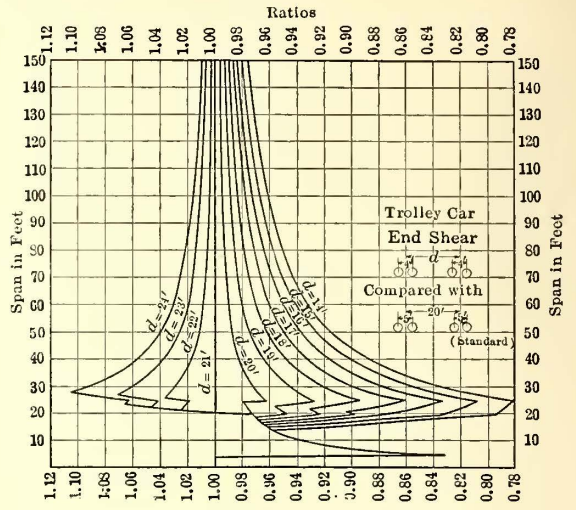
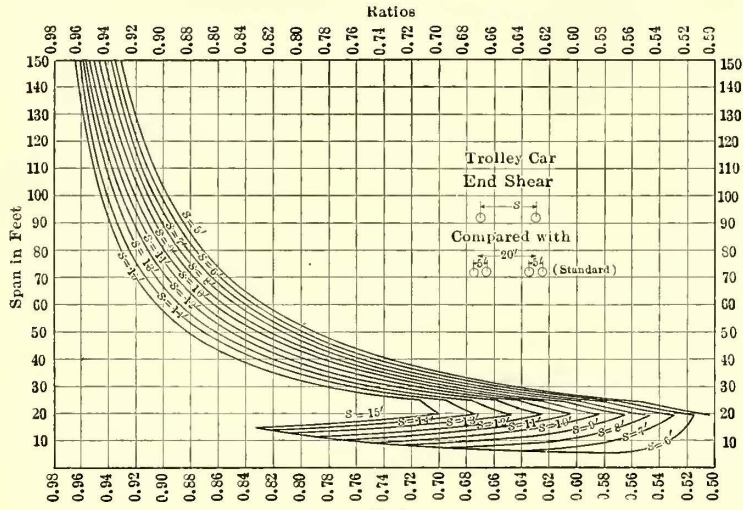
"In general, where the ratio of actual stress to that al-



lowed by the Massachusetts Railroad Commission specifications is:

less than 1.00, it is called 'ample';  
 between 1.00 and 1.15, it is called 'good';  
 between 1.15 and 1.25, it is called 'fair';

The study of the Bank Street bridge was much more complicated owing to the presence of a roadway and sidewalk and is therefore not reproduced. It may be stated, however, that the calculations were made to cover a great variety of combinations of weights of cars and other



Connecticut Way—End-Shear and Maximum-Moment Diagrams for Bridge Loading

between 1.25 and 1.40, it is called 'permissible';  
 above 1.40, it is called 'not permissible.'

The foregoing report was followed by a loading study of each bridge, as will be understood from the calculations for bridge No. 1004 printed on the next page.

vehicles. Thus, under certain conditions 50-ton double-truck cars were not permissible if the weight of the roadway and sidewalk was equivalent to 100 lb. per square foot. The effect of corrosion was also noted.

One of the most interesting results of the report made

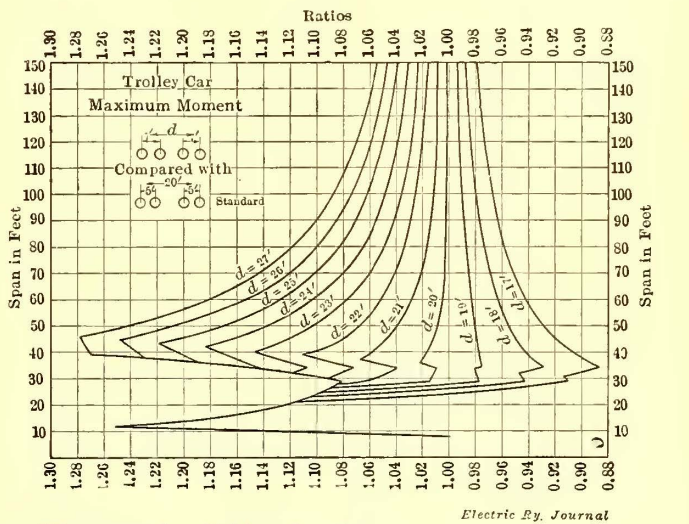
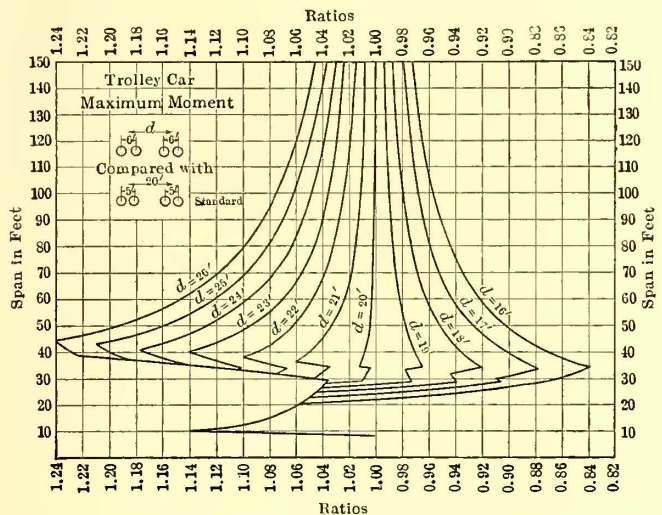
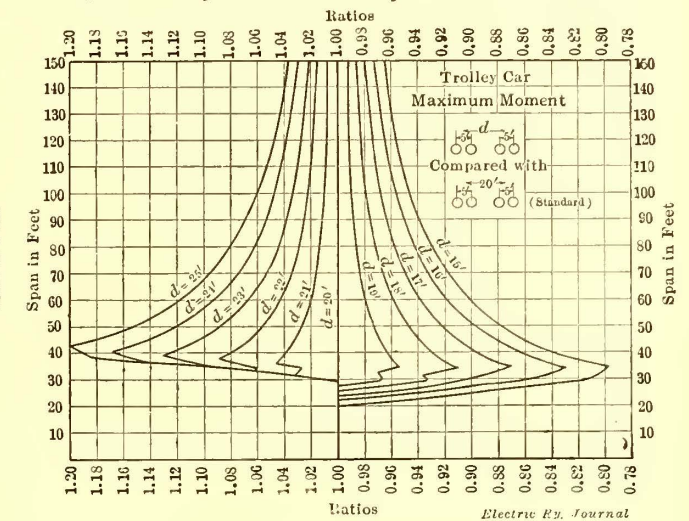
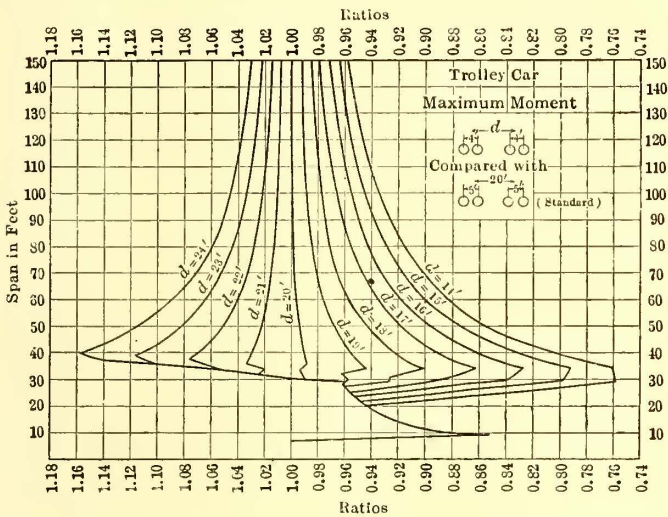


by Mr. Keith was his working out of a series of end shear and maximum moment diagrams as reproduced on pages 642 and 643, whereby when the span of the bridge and permissible weight of car with the standard Massachusetts wheelbase are given the capacity of the bridge can be corrected for a definite wheelbase; or, in other words, given the capacity of the bridge for loading on a certain wheelbase, approximations can be made by means of the diagrams for safe loading with any other wheelbase. It should be

understood that these curves are based on the assumption that the weight distribution on the axles of the car is approximately equal throughout. Thus the curves would not apply to a car fitted with one motor and one trail truck.

INTERURBAN RAILWAYS OF AUSTRIA

The official statistics of the Austrian government for the calendar year of 1911 on secondary or interurban rail-



Connecticut Way—Maximum-Moment Diagrams for Bridge Loading

CONNECTICUT RAILWAY & LIGHTING COMPANY, WATERBURY DISTRICT  
Waterbury Extension, Cheshire Street Railway.

Scott's to Waterbury. Cheshire.  
Over Northampton division N. Y., N. H. & H. R. R.—½ mile west of Scott's; also over driveway and brook east of railroad.  
Deck girder ..... span 60 ft. 7½ in.  
Live load ..... 1 50-ton double-truck car

	Max. Moment, Inch-Lb.	End Shear, Lb.	Shear, Lb., 6 Ft. from End
Live .....	6,232,900	39,700	34,770
Impact .....	1,348,000	8,600	7,520
Dead .....	2,430,000	13,200	10,560
	<u>10,010,900</u>	<u>61,500</u>	<u>52,850</u>

Effective depth ..... 50.58 in.  
Net area of flange ..... 3.92 sq. in.  
Unit stress ..... 14,220 lb. per sq. in.  
Allowed by Massachusetts Railroad Commission ..... 16,000 lb. per sq. in.  
Ratio ..... 0.89  
Unit shear at end ..... 3025 lb. per sq. in.  
Allowed by Massachusetts Railroad Commission ..... 7080 lb. per sq. in.  
Ratio ..... 0.43  
Unit shear 6 ft. from end ..... 2610 lb. per sq. in.  
Allowed by Massachusetts Railroad Commission ..... 2900 lb. per sq. in.  
Ratio ..... 0.90  
End pitch required ..... 4.3 in.  
Actual pitch ..... .3 in.  
Ratio ..... 0.70  
(Ample for 50-ton double-truck car.)

ways show a total mileage of 473 miles, of which 383 miles are electrically operated. Of the latter mileage 64.5 per cent is standard gage and the remainder narrow gage. More than three-fourths of the electric mileage was on highways.

The electric lines in question operated ten locomotives, 2242 motor cars and 1976 trailers with a total seating capacity of 161,941. The number of passengers carried was 451,580,269 and the amount of freight 209,171 metric tons. The passenger miles were 1,055,484,200 and the metric ton miles 543,587. The electric lines earned \$13,510,940, of which 98.9 per cent was due to passenger business. The total operating expenses were 67.76 per cent of the gross earnings. The average surplus was 9.48 per cent on the investment, the latter being equivalent to \$147,230 per mile of track.

It is reported that the Maschinenfabrik Oerlikon, near Zurich, Switzerland, has received an order for the electric equipments of more than forty trains for the electric section of the London & North Western Railway in England.

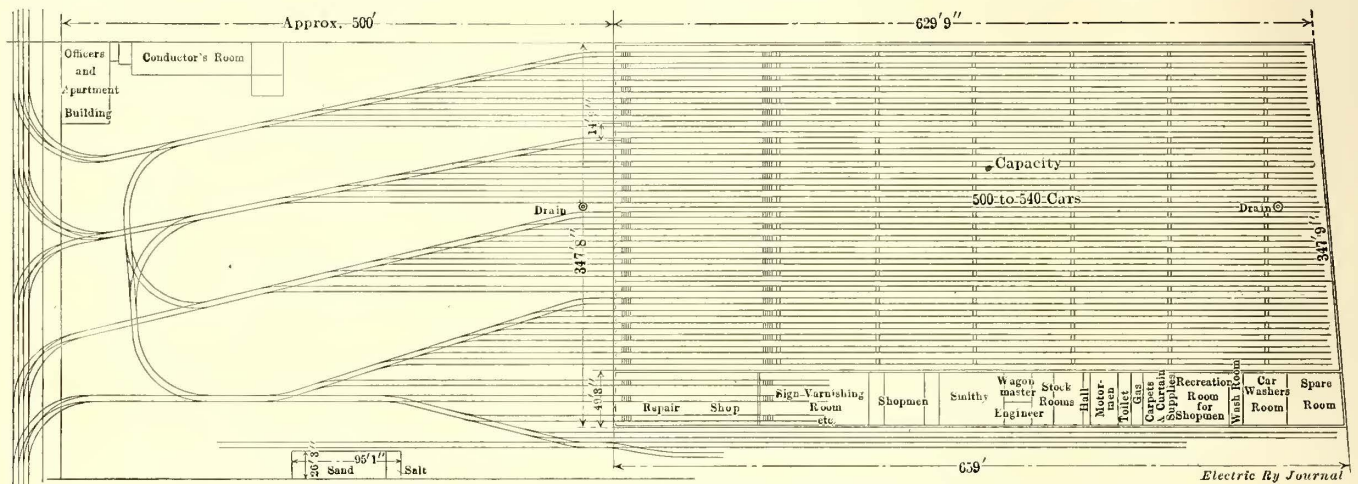


# Old and New Carhouses at Berlin, Germany

Brief Descriptions Are Presented to Show Recent Changes in the Carhouse Construction Standards of the Great Berlin Street Railway

The Grosse Berliner Strassenbahn (Great Berlin Street Railway) is the largest street railway on the Continent of Europe and operated at the end of the year 1912 a total of 1757 motor cars and 1091 trailers. The increase of this company's business and the expansion of the Berlin metropolitan area made it necessary recently to build five car-

substantially alike, consisting of a short two-track or three-track light repair shop, forming a part of a partitioned utilities bay, and a storage structure with two-car or four-car open pits per track at both ends or one end respectively, according to the layout. The accompanying plan of the Lichtenberg carhouse will serve to show approximately

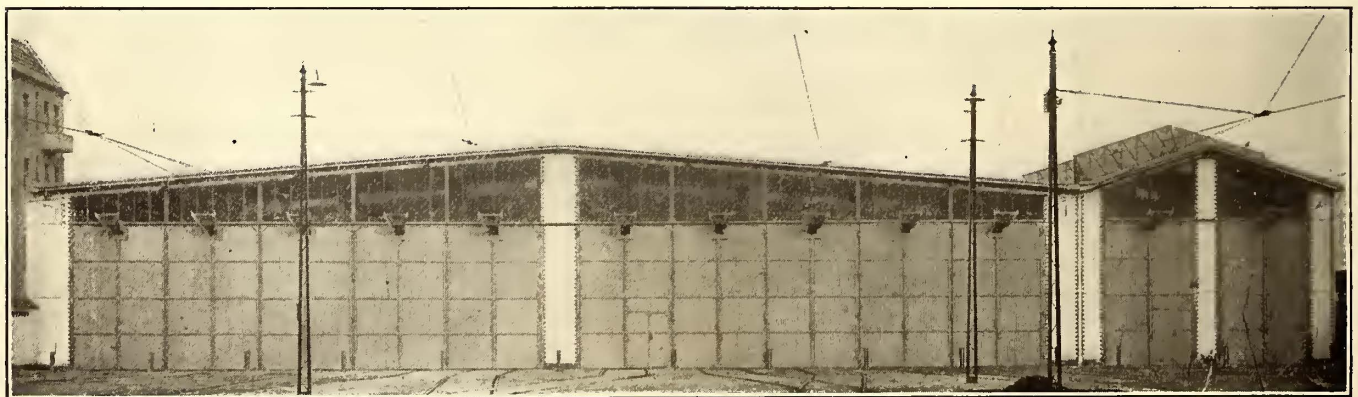


Berlin Carhouses—Plan of Lichtenberg Car Storage Installation, the Largest in Europe.

houses. Of these structures, those at Britz, Weissensee and Lichtenberg have been completed, while those at Mariendorf and Steglitz are scheduled for completion before the end of this year. The land for all buildings except at Steglitz was donated by the authorities of the local suburban towns to the company. The value of the land at Britz is estimated at \$150,000 and that at Lichtenberg at approximately \$166,000. The capacities of the new carhouses in cars are as follows: Britz, 200 to 240; Weissensee, 200 to 240; Mariendorf, 160; Steglitz, 260; Lichtenberg, 500 to 540. The last, which will be the largest carhouse in Europe, will replace three old carhouses, but the other structures were built principally to care for line extensions. In accordance with the company's practice it

the arrangements at the other buildings also. The transportation features such as conductors' and receivers' rooms, public ticket offices, etc., are placed in a nearby building, which is furnished with living apartments for the local superintendent and other officials whose presence outside of their regular working hours is desirable.

The older type of carhouse, of which the one illustrated (Huttenstrasse, Charlottenburg) is a typical example, is constructed of brick walls and wooden roofs on heavy steel trusses. The front of the building is of highly ornate brick of castellated style forming solid arches for track entrances with wooden swing doors. In the Charlottenburg carhouse partition walls separate the building into four six-track bays, and fire parapet walls are carried at



Berlin Carhouses—Front of New Weissensee Carhouse, Showing Use of Glass Above Doorways, Shop Section at Right

has provided ample room for switching cars within yard limits, instead of using the street, at all of the new installations except at Britz. The yard wires are carried from latticed A-poles with ornamental caps. Much attention has also been given toward making these yards attractive by means of gardens.

The general arrangement of all the new carhouses is

the base of the steep slope formed by the roofs of adjoining bays.

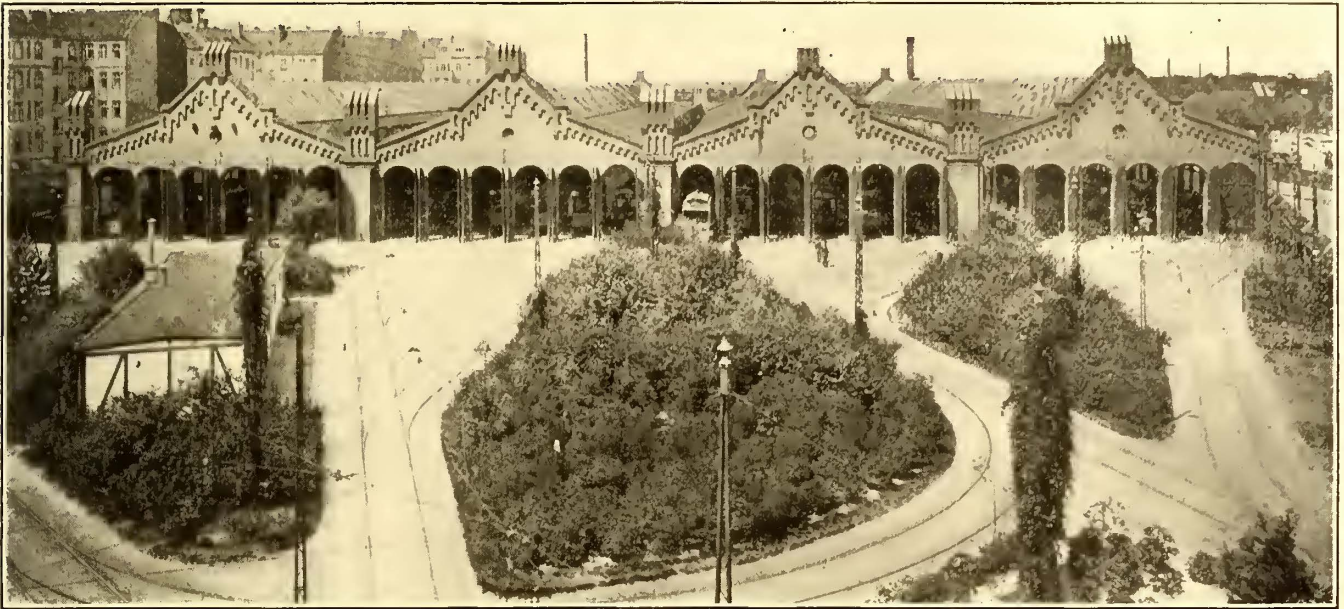
The new carhouses are also constructed of brick, but the only partition wall is that which separates the storage section from the shop and utilities bay. The roof is of wood carried on light steel trusses, which in turn are supported by the walls and one or more rows of A-form latticed



columns spaced 26 ft. 3 in. It is evident from the view of the Weissensee carhouse that the inclination of the roof is much less than in the old carhouses, so that in this way the company secures considerable economy in material. The clearance between the floor and bottom member of the roof trusses is 16 ft. 5 in. The roof, as at Britz, is

installing the standpipe connections in glazed dust-tight boxes.

It is clear from the foregoing description of the constructional features of the new carhouses that economy in first cost was a prime consideration in their design. Arthur Busse, chief engineer of way and structure Great Berlin



Berlin Carhouses—Charlottenburg Installation, Which Is Typical of the Older Designs

fitted with transverse wired-glass skylights, the whole comprising 25 per cent of the roof area. Additional natural light is also obtained by the use of glass above the doors. These track doors are of the swinging type and are built of corrugated iron. One or more of these doors have smaller doors built in so that a man can enter the carhouse without opening the track doors. The devil-strips

Street Railway, estimates that their average cost per car stored is but two-thirds that of the older structures. The construction cost of the Britz installation for 200 to 240 cars was \$150,000.

#### DETAILS OF INDIVIDUAL INSTALLATIONS

The Britz carhouse is 656 ft. long and 139 ft. wide. The utilities section, which includes a substation, is 26 ft. wide



Berlin Carhouses—General View of New Weissensee Carhouse, Showing Switching Yard and Entrance Gates in the Foreground

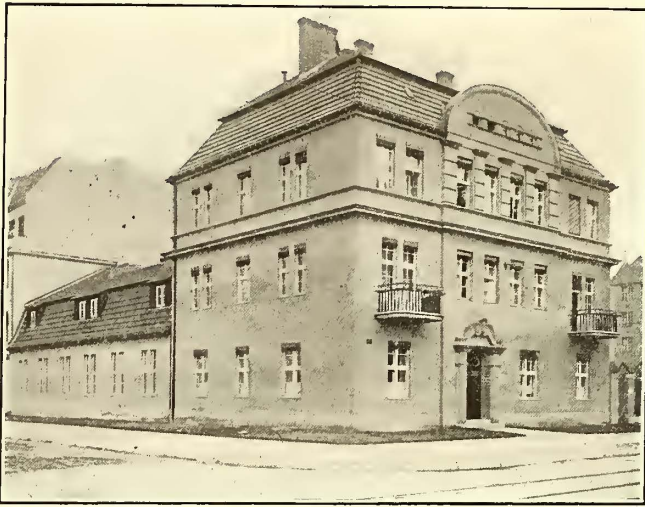
and pit floors are of concrete and are carried on diagonal trusses which are connected to channel-iron pit columns. The devil-strips are usually 5 ft. 10 in. wide. The pit rails are bolted directly to I-beams. These carhouses are not heated, but the company prevents the freezing of the water lines in winter by packing all exposed piping in jute and

and is so placed that it will form the center of the enlarged structure. Unlike the other new carhouses, this one was intended for double-end operation but it is not so used. The double-end construction accounts for the use of two-car pits at each end of nine of the ten storage tracks instead of two-car pits at the entrance only. Storage track



No. 1 along the outer wall has four two-car pits alternately with flush sections. There are two tracks with pits in the repair shop. Sliding doors in the partition give access between the carhouse proper and the utilities section.

The Weissensee carhouse is 656 ft. long x 148 ft. wide. It is almost a duplicate of the earlier Britz installation

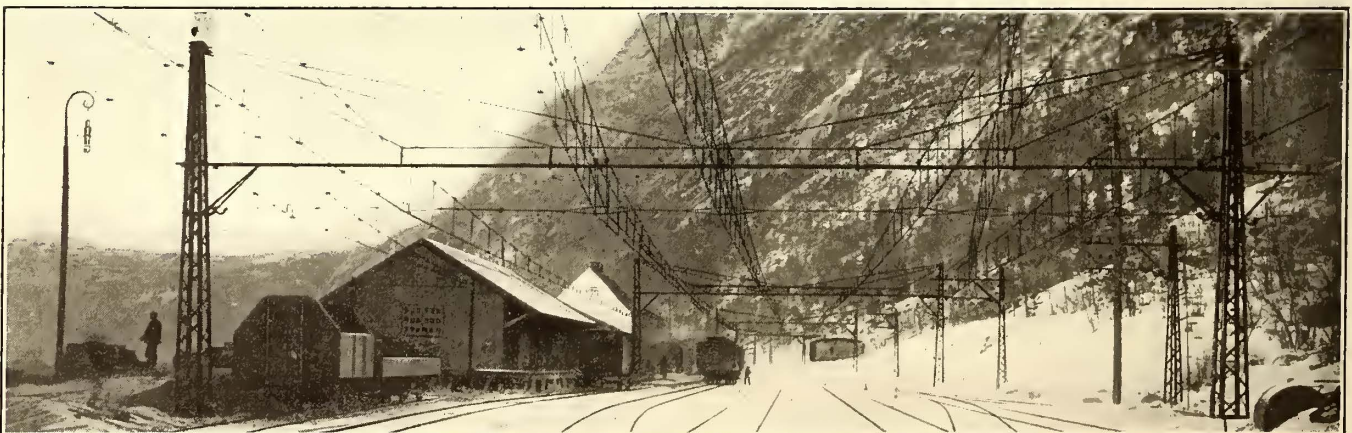


**Berlin Carhouses—Combined Office, Apartment Structure and Employees' Restaurant Near Weissensee Carhouse**

except that it is single-ended and that the track along the outside wall has a pit for its entire length. This carhouse, which was opened on Oct. 11, 1913, is the headquarters of seven officers, 207 motormen, 234 conductors (including trail-car conductors), twenty-seven mechanics and thirty-one car cleaners, pitmen, etc.

One of the accompanying illustrations shows the handsome cement-faced building which is used for the business of the transportation department and for living apartments for several local division officers. The one-story annex is the company's first carhouse canteen since the old ones were discarded some years ago. The new installation includes an excellent restaurant where a great variety of cold and warm foods is obtainable at practically cost prices. A similar restaurant has been operated at the shops for many years.

The plan of the Lichtenberg carhouse on page 644 shows that this structure, which was opened on Aug. 16,



**Rjukan Railway—Single Catenary Construction from Bridges at Stations**

has a maximum length of 659 ft. and a maximum width of 347 ft. 9 in. It has twenty through storage tracks and three two-car shop tracks. Ladder tracks and loops permit any desired car shifting within the yard limits. About 280,000 passengers a day are handled in cars run from this station.

## THE RJUKAN RAILWAY

The first standard-gage single-phase electrification of Norway has recently been made in the southern part of that country on the Rjukan Railway. The line consists of two sections separated by the Tinnsee. The northern section is the Vestfjorddals Railway, 10 miles long, running from Saaheim to the Tinnsee, and the southern section is the Tinnoset Railway, about 18.6 miles long, running from Tinnoset to Notodden along Lake Hitterdals. The con-



**Berlin Carhouses—Interior of New Weissensee Carhouse, Showing Truss Roof and Steel Columns**

nection between the two sections will be made by means of a ferry across the lake.

The chief business of the railway is the transport to Notodden of artificial saltpeter manufactured in Saaheim. Trains, with a maximum trailer weight of 290 metric tons, are drawn on the section from Notodden to Lilleherred (which has a constant grade of about 2.7 per cent) by two locomotives, one locomotive being employed for the other sections. Three four-axle and two two-axle locomotives have been supplied. The former have two two-axle trucks, are fitted with four 125-hp alternating-current motors and weigh approximately 46 tons. The two-axle locomotives have two motors of the same size and weigh about 23 tons. The locomotives are constructed for a line potential of 10,000 volts to 11,000 volts and 15 cycles to 16 cycles and are provided with contactor control.

The overhead suspension is of the single catenary type with a steel messenger of 31.5 sq. mm (No. 2 B. & S.)

cross-section, a contact wire of 65 sq. mm (No. 00 B. & S.) cross-section and hangers of 3-mm (0.09-in.) diameter with top and bottom clamp installed at intervals of 16 ft. 5 in. At crossings and stations the spacing between hangers is reduced to 8 ft. to insure greater safety. The



normal clearance between the top of the rails and the contact wire is 18 ft., but it is as low as 14 ft. 9 in. for tunnels, bridges and yards. Equal wear of the bow collector is assured by zigzagging the contact wire 17½ in. from the center line.

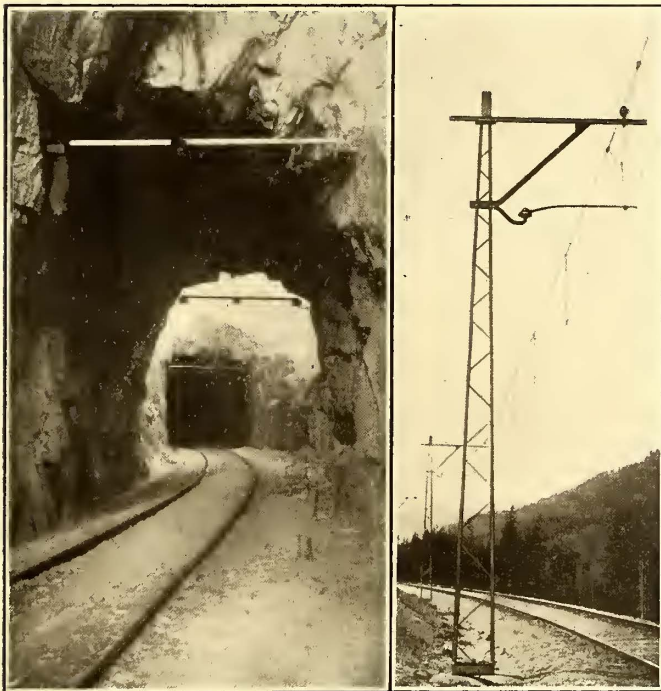
Along the right-of-way the overhead line is carried from steel brackets on A-frame lattice poles set 7 ft. 10 in. from the center line of the track, while in yards it is carried from pyramid-type towers with span suspension. The usual pole spacing is 177 ft., but an additional strain pole is in-



Rjukan Railway—Motor Car

stalled on curves of 1640-ft. radius or less. All poles are grounded and provided with a danger sign. In the two tunnels the contact wire is suspended from an intermediate insulator which is attached to a rigid span member at intervals of 16 ft. 5 in. Each end of the span is attached to an insulator, the arm of which is in turn anchored in the walls of the tunnel.

The catenary cable is carried over each bracket arm in the groove of a porcelain double-petticoat insulator. Anchor poles for the catenary are installed at intervals of about 3300 ft. Special anchor insulators are located between these poles and the overhead line. Three hand-operated tension take-up devices are also placed in each anchorage section.



Rjukan Railway—Construction in Tunnels and on Open Single Track

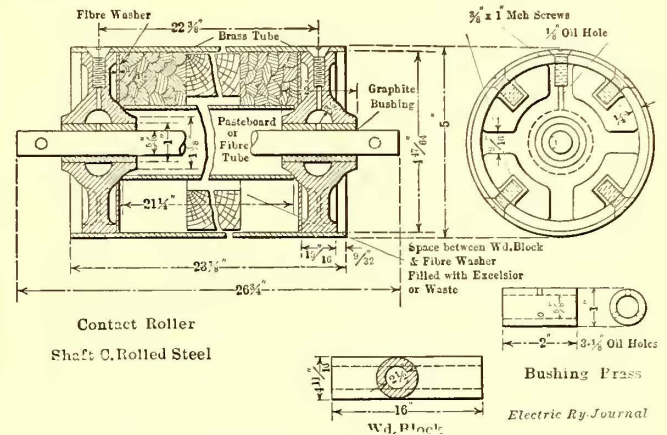
Section insulators isolate the line into divisions about 15,400 ft. long. In addition, the overhead line opposite each station can be cut out by circuit-breakers carried on the top of the poles. These breakers are operated from below by

chains which are fastened to a lock mechanism on the post in such manner that they can be operated only by authorized employees who are supplied with a key. All section insulators are protected with a lightning arrester.

The power supply is derived from a separate converter station for each section of the line, as only 50-cycle, three-phase current at a pressure of 10,000 volts to 11,000 volts is available. The converter station which feeds the Vestfjorddals railway is situated in Vestfjorddalen. It contains two converter sets, each of which consists of a three-phase transformer which steps down the 10,000-volt pressure to 500 volts and feeds an asynchronous motor driving an alternating-current generator with an output of 400 kva at 15 cycles to 16 cycles. The latter supplies single-phase current at a terminal pressure of 10,000 volts. The converter station receives the necessary energy from the Rjukan power station, about 3.1 miles distant. The Tinnos Railway is fed from the Svaelffos converter station, which is placed in the railway power station. The equipment consists of three converter sets similar to those described hereinbefore. All line supplies and apparatus were furnished by the Allgemeine Electricitäts-Gesellschaft.

THE ROLLER TROLLEY

The adoption of the roller trolley and pantograph on several recent heavy-traction, high-tension, direct-current lines makes a short account of the construction of this roller first of interest. It was developed and used on a large scale first on the Key Route cars in Oakland and Berkeley, Cal.



Latest Roller Trolley—Key Route, California

On these lines trains of six or more heavy cars run at high speeds with an ordinary trolley voltage, and this made necessary a current collector which would have greater capacity than the ordinary trolley. Since the first roller trolley was adopted on that line several improvements have been made, and the accompanying engraving shows the latest type of Key Route trolley.

The roller is mounted on a pantograph frame and weighs, complete with spindle, 28 lb. The wearing surface is a tube of non-arcng brass, supported on a wooden roller. The height of the trolley wire above the head of the rail varies from 14 ft. 6 in. to 22 ft., yet, owing to the pantograph construction, the pressure of the roller against the wire is kept practically constant at about 34 lb. The average mileage of the rollers is 55,000. The cost of manufacture on a large scale is \$6.62 each.

The Elevated & Underground Railway Company, Berlin, Germany, is planning to establish auto-bus lines. It is reported that the police will soon grant the company running powers for two such lines. Both of these lines are to start from Neuköln but will follow different courses to establish connection with the Stettin trunk line station and the Prenzlau station of the Berlin steam belt railway.



# Electric Railway Construction in Paris

The Principal Surface Electric Railway System in Paris Is Undergoing Extensive Rehabilitation—The Standard Car Will Have a Center Entrance and Will Be Mounted on a Single Truck with an 11-ft. 10-in. Wheelbase

The principal tramway system of Paris, that owned by the General Omnibus Company, is undergoing extensive rehabilitation. Up to about three years ago no attempt had been made to introduce electric power except on a very small scale, because the early expiration of the company's franchise did not warrant the investment of any large sum of money in street construction or other property which could not be removed from the streets in case the franchise was not renewed. On May 31, 1910, however, an extension for forty-five years was granted by the municipality, and an abstract of the franchise then granted was printed on page 505 of the issue of this paper for Oct. 1, 1910. Under this franchise the company is installing electric power and will use the underground conduit construction in the central portion of the city and trolley in the outlying portions. Pending this change a considerable portion of the system is being operated with the old motive powers.

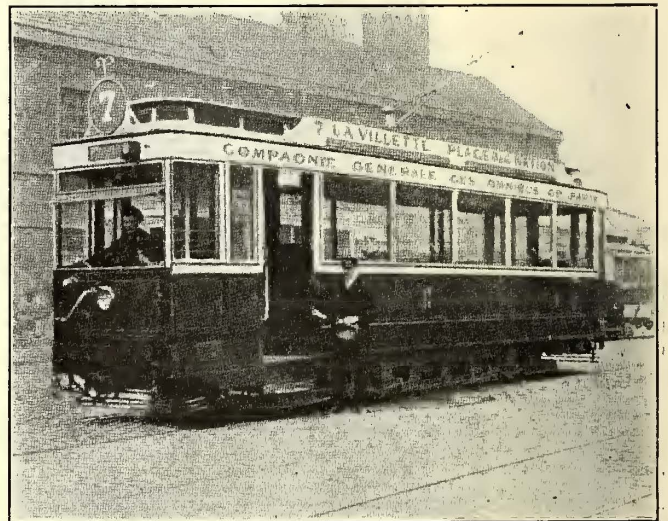
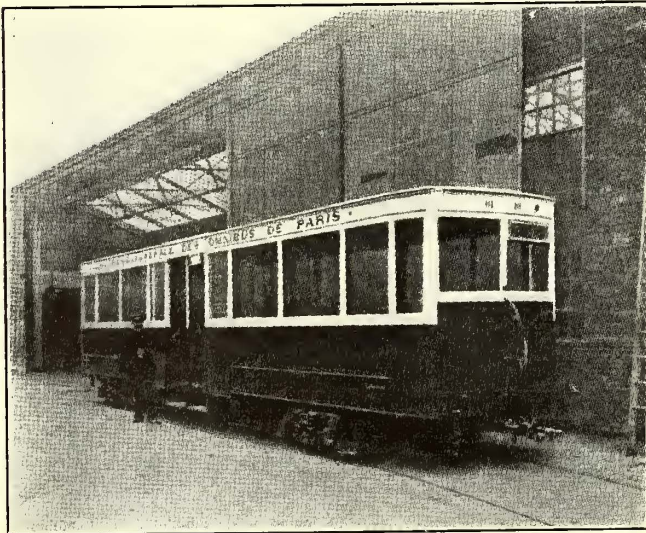
Previously, where the underground conduit system has been employed in Paris, and it has been installed for short sections by a few other companies there, the "side conduit" has been employed. In the side-conduit system the conduit

center conduit is only 25 mm (1 in.) in width. This change will greatly reduce the amount of dirt which will get into the conduit. Again, the slot rails and entire conduit construction had to be made heavier with the side conduit because it had to support the weight of the cars, whereas the center conduit supports simply the vehicular traffic. It will also be much easier to remove the slot rails and get at the conductors in the conduit with the center construction, and the construction at switches and turnouts will be much simplified.

The method of conduit construction, according to the report printed in the foreign paper mentioned, seems to be very similar to that followed in New York. After a trench has been excavated, the yokes and the slot rails and running rails are set in place and aligned. Then a sheet-iron liner is inserted, and the concrete is put in place. The wooden blocks used to hold the yokes and rails in place are then removed, and the space occupied by them is filled with concrete.

## NEW TYPES OF CARS

Mr. Mariage also gives an account of the new types of cars which are now being built for the system. A study



Paris Tramway Rehabilitation—Double-Truck Trail Car and Single-Truck Motor Car for Light Service

is placed at the side of the track instead of at the center, and its slot rails are used instead of a rail for one side of the track. This plan has now been abandoned, and in all new track construction in Paris the conduit is in the center of the track, as in New York and Washington. The standard depth of the excavation is 0.88 m (34¼ in.). The yoke is 0.78 m (30½ in.) in depth and rests on a layer of concrete 0.10 m (4 in.) in thickness. On certain parts of the line, however, a shallower conduit is used where the circumstances did not permit the standard form of construction without great cost.

In an article which appeared in a recent issue of *L'Industrie des Tramways* by M. A. Mariage, general manager of the company, the reasons are given for the change from the side conduit to the center conduit. One of these is that it is possible to use a narrow slot, because the side conduit requires a slot large enough for the wheel flange, whereas the center conduit has to accommodate only the plow. The slot in the side conduit in Paris is from 30 mm to 35 mm (1¼ in. to 1½ in.) in width. The slot with the

was made of all types of cars, including the double-deck car which has been used to some extent in Paris. Finally the company decided in favor of the single-deck car throughout. It has adopted for most of its service a center-entrance motor car 40 ft. 1 in. over all, mounted on a long-wheelbase truck and capable of hauling a trailer. For lines with light grades the company has adopted a maximum-traction truck car, also with center entrance. This car was not adopted as standard principally because it could not haul a trailer on a 3 per cent grade. For light traffic lines the company has adopted an end-entrance single-truck car somewhat shorter than the standard single-truck car.

The long-wheelbase truck for the standard motor car for city service is illustrated in two engravings. The wheelbase is 3.6 m (11 ft. 10 in.), yet this truck operates without difficulty around a curve with 18-m (59-ft.) radius, with a suitable selection of wheel flange, in spite of the fact that there is no radial action in the axles. One truck of this type has been in service since October, 1911, and



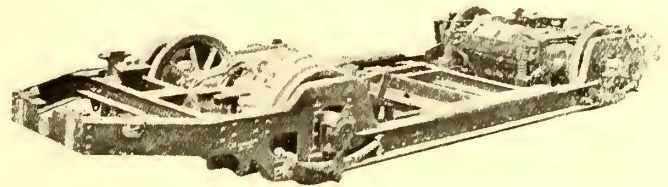
twenty others since November, 1912, with satisfactory results. The car body is supported on this truck by two sets of springs, one set being spiral springs carried on a spring plank at each end of the truck, the other set being semi-elliptic springs under the journal boxes, as shown by the illustrations.

The car body to go on this truck is no less interesting than the truck itself. Owing to the limitations of width imposed by the narrow streets in Paris, single seats have to be used on one side of the center aisle, yet by an ingenious arrangement of seats the car provides seats for thirty passengers and standing room for nineteen more. As already stated, the car has a center entrance with double sliding doors. The first step is 32 cm (12½ in.) and the second step is 25 cm (10 in.) in height, making the car floor 22½ in. above the head of the rail.

The construction of the body is largely of steel, and an effort has been made to secure a maximum of lightness. Flanged sheet steel is used for the body panels, the sheet-steel plate being carried around to form the end panels and being tied in with light framework around the center

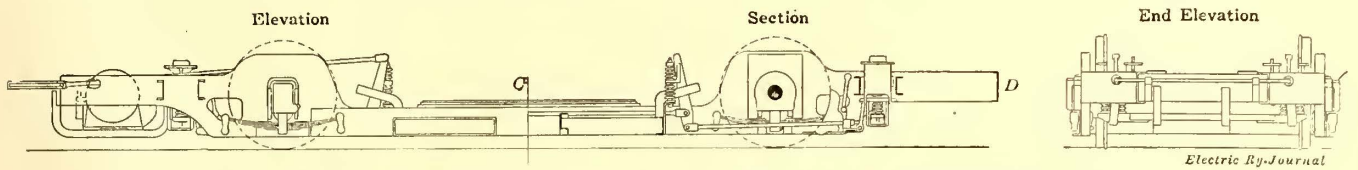
electrical equipment is 14.8 metric tons (29,600 lb.), or 822 lb. per passenger. The construction is also of steel and very similar to that of the single-truck car already described.

For lines of light traffic the company is also using the



Paris Tramway Rehabilitation—Long-Wheelbase Truck for Standard Motor Car

end-platform single-truck car illustrated. This car has a length of 10.3 m (33 ft. 9 in.) and a wheelbase of 3.25 m (10 ft. 9 in.). It has accommodation for forty-five passengers, of whom thirty can be seated, and weighs 12.5 metric tons (27,500 lb.).

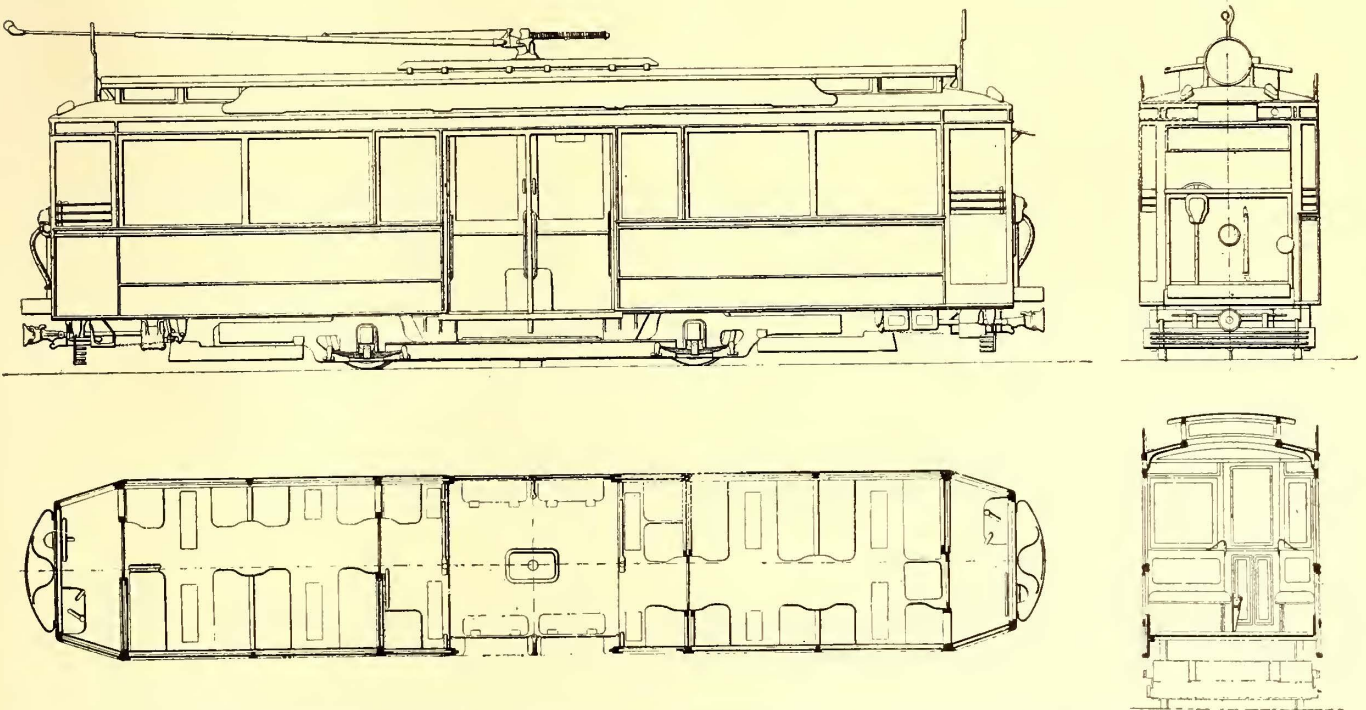


Paris Tramway Rehabilitation—Elevations and Section of Long-Wheelbase Truck

entrance and to the steel side posts. The weight of the car complete with truck and electrical equipment is 13.5 metric tons (29,700 lb.), or 742 lb. per linear foot, or 990 lb. per seat.

This car will be used in times of heavy service with a double-truck trail car, also illustrated. The truck of this trail car is of the simple arch type with small diameter wheels. This car also has a center entrance and seats

All cars, including trail cars, are equipped with the Westinghouse straight-air brake. The long-wheelbase motor cars use GE-216 motors. The maximum traction cars are equipped with TH-523 motors. On one of the interurban lines the company will use a three-car train consisting of two motor cars and one trail car with multiple-unit control. For the lines now under construction the company will require 200 motor cars with maximum trac-



Paris Tramway Rehabilitation—Plan, Elevation and Sections of Standard Motor Car

thirty-eight passengers with standing room for nineteen passengers. The weight empty is 7.9 metric tons (17,380 lb.), or 457 lb. per passenger.

The maximum-traction truck car also has a center entrance. This car seats thirty-six passengers and also has room for eighteen standing passengers. Its weight with

tion trucks, 450 motor cars with long-wheelbase single trucks and 400 trail cars.

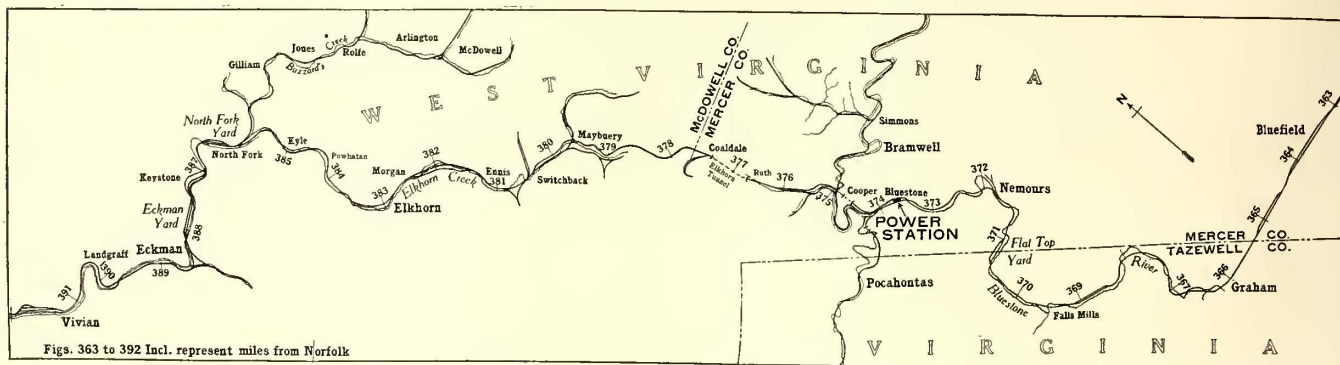
The standard motor cars will be lighted by two circuits of nine lamps each in series, and a 10-volt storage battery auxiliary is provided to supply an auxiliary circuit of lights in the case of interruption to the main circuit.



### LOCOMOTIVES FOR THE NORFOLK & WESTERN ELECTRIFICATION

The locomotives for the most recent electrification project, that of the Norfolk & Western Railway, will be the first to be commercially used in this country with a combined jack shaft and gear drive. These machines, as

connected through twin gearing to a jack shaft. They are to be of the polyphase, twenty-five-cycle induction type with wound secondaries, which are connected in cascade for producing low speed in starting and switching. There are two running speeds, 28 and 14 m.p.h., and a switching speed of 7 m.p.h. In starting with the 7-mile combination, the motor on each truck will be connected in cascade, and



Norfolk & Western Locomotives—Map of Electrified Part of Line

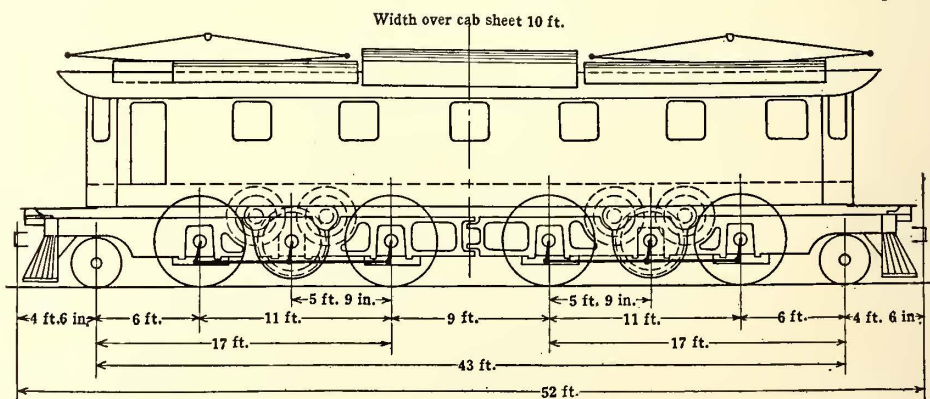
reported in recent issues of the *ELECTRIC RAILWAY JOURNAL*, will have articulated trucks and will weigh complete approximately 130 tons each. As shown in the accompanying illustration, four driving axles and two carrying axles are used, the wheelbase being divided into two separate units or trucks, connected at adjacent ends by a hinge coupling. The carrying axles are mounted radially, and each main truck has two driving axles and one radial axle. The outer ends of the trucks are fitted with standard buffers and friction draft gear with standard couplers, the drawbar pull being transmitted through the truck frames to the train. The weight does not exceed 57,000 lb. per pair of drivers and is sufficient to produce a tractive adhesion for a maximum effort of 62,500 lb. per locomotive, the weight on each radial axle being not less than 20,000 lb. at the rail. The locomotive will, with forced ventilation, have sufficient capacity to exert continuously a tractive effort of 33,600 lb.

the two sets of cascades will be connected in parallel. Resistance will be inserted in the secondaries at starting. In this combination the primaries will be arranged for eight poles. With the 14-mile combination all motors will be in parallel connected for eight poles, and with the 28-mile combination the four-pole arrangement will be used, resistance being used on intermediate steps.

A single cab supported on the trucks at suitable bearing points contains the operating and control apparatus of the locomotive. The cab is of the box form, provided with end doors and platforms for convenient passage between two or more locomotives when coupled together, and between the locomotive and train; in addition, side doors are provided at diagonally opposite corners. There are also side and end windows for lighting the cab. The apparatus is arranged along the center of the cab, making it conveniently accessible and leaving a clear, unobstructed passageway at either side.

A multiple-unit system of control is to be provided for the independent operation of each locomotive, or for the operation of two units simultaneously from the control end of either locomotive in whatever order or arrangement the locomotive may be coupled together. The control equipment is arranged and constructed to provide for the use of single-phase current from the pantograph trolley, which is connected to the primary winding of the main transformer through a suitable line switch, and from the secondary of the transformer circuits will be established through and in connection with the phase converter in such a manner as to deliver polyphase current to the main motors.

Each locomotive is to be provided with an air compressor



Norfolk & Western Locomotives—Side Elevation Showing Arrangement of Motors and Gears

The control apparatus, both air and electric, is located at one end of the cab, in such a manner as to leave an unobstructed view along the track. The operator's seat is placed so that there will be a clear view of the signals.

Each locomotive is provided with two overhead pantograph trolleys having automatic self-adjusting action and arranged for a working height of 16 ft. under bridges or other permanent structures and a normal height of 24 ft. along the open line, the trolleys being controlled by air pressure.

The motors, which are of Westinghouse make, will be driven from the phase converter, through a multiple-disk friction clutch. This clutch is controlled by the main reservoir pressure so that the compressor is operated only as required. Straight-air and automatic air brakes will be installed together with the necessary ventilating apparatus for the motors. The electrical equipment has been designed with special consideration for regeneration and electric braking at grades, both for the purpose of safety and for economy of operation, the local conditions being very favorable for this type of operation.

The motors, which are of Westinghouse make, will be



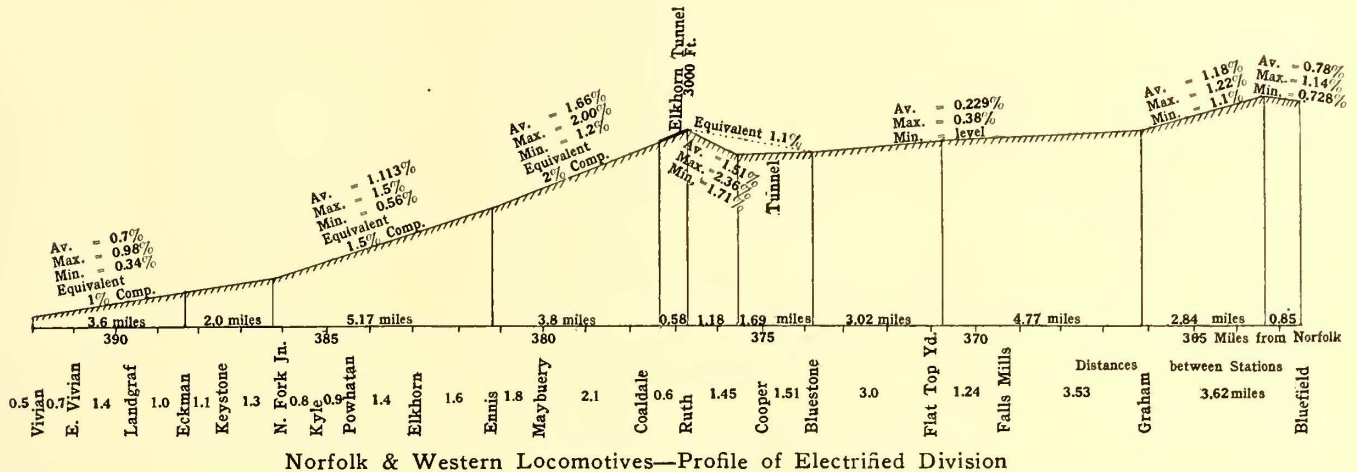
LOCOMOTIVE SERVICE

As the electrified section is about 30 miles long, extending from Vivian, W. Va., to Bluefield, W. Va., and is provided with numerous industrial sidings and storage and terminal yards, the work of the locomotives will consist in large part of switching service. East-bound trains are to be made up either at Vivian, Eckman or North Fork, to a

also be used as a switcher to pick up loaded cars at the various stops on the grade. The tractive efforts exerted under the various operating conditions are given in the accompanying table.

POWER HOUSE EQUIPMENT

The power house will be located at Bluestone, the equipment consisting of three 9000-kw, single-phase, twenty-five



Norfolk & Western Locomotives—Profile of Electrified Division

normal weight of 3250 tons, and to be run through to Flat Top or Bluefield. At Flat Top they may be filled out to 3500 tons for movement to Bluefield. Trains of 3250 tons may be operated through to Bluefield without filling out at Flat Top, and in that event the locomotives are to be capable of operating at approximately 28 m.p.h. from Cooper to Graham. West-bound trains are in general made up of empties as required and run from Bluefield to points of distribution at the various coal operations on the grade west of the Elkhorn tunnel, or these empty trains may be run through to Eckman or Vivian. East-bound trains average about forty-five loaded cars each up the Elkhorn grade and may be filled out to fifty loaded cars at Flat Top. Standard west-bound trains consist of about sixty-five cars of empties, but lighter trains are run as occasion demands. Loaded trains are sometimes run west from Flat Top, and

cycle, 11,000-volt Westinghouse turbo-generator units operating at 1500 r.p.m., with two turbo-excitors, a motor-generator set exciter, together with step-up transformers for 33,000-volt transmission lines to feed the transformer substations.

TRAMWAYS IN GREAT BRITAIN AND IRELAND

In its issues of Aug. 8 and 15 the London *Electrician* published an analysis, prepared by A. J. Lawson, of the operating results of the tramways in the United Kingdom. This statement was based upon the report of the Board of Trade for the calendar year 1911 in the case of companies and for the year ended March 31, 1912, in the case of municipalities.

Since 1895 municipalities and companies have expended on the construction of their lines £77,377,390, of which £58,051,093 was raised by loans and debentures and £18,011,093 by stock; £11,000,000 of this loan capital has been repaid or provided for. The total length of track at present is 2,637.05 route miles, of which 1,660.75 are double-track and 976.3 single-track, the total equivalent length of single-track line being 4,298.8 miles. In addition, 5.2 miles of road are being worked by trackless trolley cars. The highest average capitalization is for the London County Council Tramways, namely £87,590. The lowest is in Halifax, £10,755.

On all of the tramways mentioned in the Board of Trade return the number of car miles run by the 12,435 electric and the 509 non-electric cars in stock at the end of the twelve months was 323,354,389, carrying 3,127,318,732 passengers, giving an average of 9.67 persons per car mile. The number of route miles worked electrically was 2,517.77, by cable 25.56 miles, by locomotives 46 miles and by animal traction 47.6 miles.

Statistics show that where the receipts per car mile on the average are not good in London and 9d. in the provinces the service is not profitable. On only five lines are the gross receipts £10,000 per route mile. These are the lines in London, Edinburgh, Hull, Liverpool and Glasgow.

Twenty-two of the municipal lines report deficits after payments of interest and sinking fund charges. On the other hand, the profits of forty-two municipal undertakings were used for the relief of rates. The highest figure for car miles per car was 35,780 and the average was 25,000. The average cost of operation was 6.64d. per car mile.

TABLE SHOWING TRACTIVE EFFORTS FOR DIFFERENT GRADES AND LOADS

	Train on 1.5 and 2 per Cent Grades	Train on 1 per Cent Grades	Train on 1.22 per Cent Grades	Train on 0.4 per Cent Grades
Weight of train, tons.....	3,250	3,250	3,500	3,250
Locomotives per train.....	4	2	3	2
Approximate speed, m.p.h.....	14	14	14	28
Drawbar pull per locomotive, lb:				
Uniform acceleration.....	45,900	57,000	47,700	39,700
On 2 per cent grade.....	37,700	.....	.....	.....
On 1 per cent grade.....	.....	42,900	.....	.....
On 1.22 per cent grade.....	.....	.....	36,000	.....
On 0.4 per cent grade.....	.....	.....	.....	23,000
Maximum accelerative tractive effort per locomotive, lb.....	62,500	62,500	62,500	45,000

these consist of about forty-five loaded cars, or 3250 tons.

Trains of 3250 tons are to be operated at a normal running speed of approximately 14 m.p.h. up grades of from 1 to 2 per cent and at a normal running speed of approximately 28 m.p.h. on level track and existing main line grades up to 0.4 per cent. The normal running speed down grades of 1 to 2.5 per cent will be approximately 15 m.p.h. when the locomotive is holding the train in regeneration.

Two single electric locomotives will form one road unit, making the round-trip runs between Bluefield and either Vivian, Eckman or North Fork, as required, handling empty cars on the west-bound trip and loaded cars on the east-bound trip. Two locomotives coupled and operated together will form one pusher unit and will make round trips between Ruth and Vivian, Eckman or North Fork. On the west-bound trip the pusher unit will be coupled to the rear of the train and will be used as a switcher to distribute empties as required on the grade. On the east-bound trip the pusher unit, operating at the rear end of the train, will



## STRIKING MAPS OF PHILADELPHIA REPORT— OFFICIALS APPROVE PLANS

The Philadelphia Department of Public Works has now issued Volume II, comprising the maps belonging to the report of A. Merritt Taylor, director of the department of city transit. An abstract of this report, which was designated as Volume I, was published in the *ELECTRIC RAILWAY JOURNAL* for Aug. 9, 1913. Many of these maps, as prepared under the direction of Ford, Bacon & Davis, consulting engineers, are of striking originality.

### APPROVAL OF TRANSIT REPORT

The complete report was approved by Mayor Blankenburg and the Select Council on Sept. 18, when the latter adopted a resolution authorizing Director Taylor "to take any and all steps necessary to carry the recommendations into effect, subject to such revision thereof as may be designated from time to time by Councils." The resolution and the Mayor's message on the subject are now in the hands of the committee on finance and street railways for investigation of the data and for final report to both branches of Councils. Director Taylor has stated that if the necessary legislation is passed work can begin April 1, 1914. Mayor Blankenburg in his letter to Councils which led to the resolution noted recommended that "there shall be submitted to vote of the people next November a permanent loan of \$9,000,000, which shall include \$4,000,000 for subway and other rapid transit work."

### LIST OF MAPS IN VOLUME II

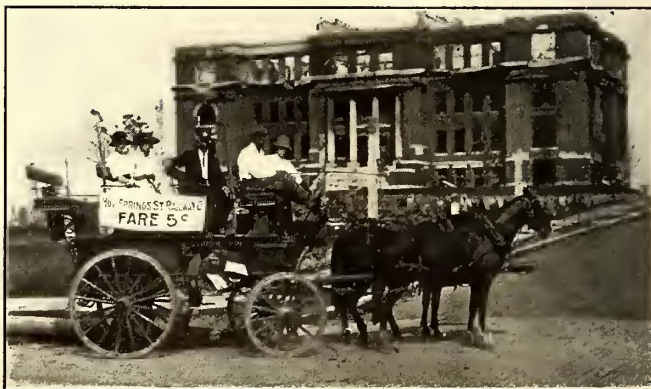
Map No. 1 of Volume II of the report shows all steam railroad passenger and suburban electric lines in metropolitan Philadelphia. Maps Nos. 2, 3 and 4 show the rapid transit systems of New York, Chicago and Boston respectively superimposed on a map of metropolitan Philadelphia. This group gives a vivid idea of the great area of Philadelphia as compared with the cities named. Map No. 5 shows electric railway time zones of the Philadelphia district and the distribution of population in 1910, while Maps Nos. 6, 7 and 8 show the time zones of New York, Chicago and Boston respectively superimposed on metropolitan Philadelphia. The figures for New York and Philadelphia show startling comparisons for the same distances, such as ten minutes against forty minutes, twenty minutes against fifty minutes, thirty minutes against sixty minutes, 100 minutes against 150 minutes, etc., all in favor of New York. The contrasts of Philadelphia with Chicago and Boston are not so great, but a difference of from ten to fifteen minutes within 5 to 6 miles of the center of travel is quite common.

Maps Nos. 9, 10, 11 and 12 show electric railway zone fares of metropolitan Philadelphia, New York, Chicago and Boston, while Maps Nos. 13, 14 and 15 present these zone fares superimposed on Philadelphia. Map No. 16 shows the steam railroad time zones of metropolitan Philadelphia, and this is followed by Maps Nos. 17, 18, 19 and 20 to cover the steam railroad fare zones of the four cities named. The rapid transit systems of Brooklyn, Chicago and Boston follow as Maps Nos. 21, 22 and 23. Maps Nos. 24 and 25 illustrate by means of colored bands the present and estimated time zones from Market Street to Broad and Eighth Streets, Philadelphia, their derivatives, Maps Nos. 26 and 27, showing the estimated time saving for the same territory if the new lines were operated with or without the co-operation of the Philadelphia Rapid Transit Company. Map No. 28 indicates the time saving in West Philadelphia from Broad Street. Map No. 29 charts by sections the composite traffic survey of 175 divisions of Philadelphia according to population, residential area in acres, passengers originating on composite day of count, equivalent revenue year to June 30, 1913, rides per capita during the year ended June 30, 1913, and revenue per capita during the same year. Map No. 30 shows the same sections and

indicates the time which their inhabitants would save by means of the proposed lines. A further analysis of these sections is offered by Map No. 31. Maps Nos. 32 to 41 inclusive show volume and distribution of traffic in various parts of the city and the amount of traffic tributary to present and proposed rapid transit lines. Map No. 42 shows the street railway lines existing in the year 1860, Maps Nos. 43 to 47 inclusive relate to lines recommended for immediate construction, tentative locations, etc. Detail plans and suggested way constructions follow in Maps Nos. 48 to 65 inclusive. The remaining maps or plans, concluding with No. 69, show time-distance diagrams, clearances of cars in subways with 12-ft. headroom and proposed design of car. The latter would be 50 ft. 6 in. over all, have three single sliding doors, each of 4 ft. opening, on each side with dividing rails for incoming and outgoing travel; seating capacity, forty-eight with all doors free or fifty-four with folding seats placed opposite the doors on one side. The seats of these cars would be longitudinal, leaving a maximum standing area of 188 sq. ft.

## QUICK WORK AFTER THE HOT SPRINGS FIRE

The Hot Springs Street Railway Company has been very busy during the past three weeks in rehabilitating its system since the disastrous fire of Sept. 5, which destroyed thirty-three business blocks at Hot Springs, including the company's power plant. As soon as large gangs of men had cleared away the debris from the car tracks, General Manager Dillon hired horses and mules, including even some which were quite antiquated, had them hitched to the old light-weight street cars, which were not too heavy for the mules to pull, and had a street car system "at your service."



Tally-ho Operated by Hot Springs Street Railway After Fire

The mule-drawn street cars attracted considerable attention and recalled the era of yesterday. As the company had only a few light-weight cars that could be drawn by mules, it put into service tally-hos, automobiles, delivery carts, buggies and anything that people could ride in. The fare remained at 5 cents, though it cost the company much more than this to haul the passengers. General Manager Dillon brought the company's slogan, "Service—That's What Counts," into play and won the day.

By herculean efforts temporary electric traction service was resumed on Thursday, Sept. 25, and on Saturday, Sept. 27, the first electric lights since the night of the fire were put into use. Although the public utilities, which are controlled by the Federal Light & Traction Company, have always been popular in Hot Springs, the company won many additional friends by its splendid efforts to give traction, lighting and gas service in spite of great handicaps suffered after the fire. Its energy and promptness in retrieving itself after the disaster received many complimentary notices in the daily press.



The Business Men's League of Hot Springs has sent out thousands of letters to counteract the general impression that the city was entirely destroyed. On the contrary, only the negro section and a part of the business section were devastated. The fine bathhouses, magnificent hotels and government reservation, as well as the principal business section and the promenade, were not touched by the fire.

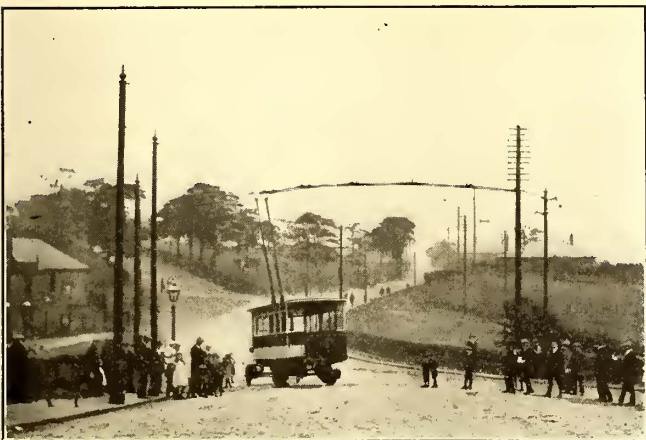


Mules Attached to Light-Weight Trolley Car After Fire

Work is now being rushed day and night on a new fire-proof 2500-kw power station. The new power plant will be far removed from the center of the city. It is expected to be completed and in operation by Jan. 1, 1914. W. A. Haller, chief engineer Federal Light & Traction Company, is in active charge of construction. Lee Skipwith, purchasing agent of the company in New York, is handling the purchases.

### TRACKLESS TROLLEYS IN ENGLAND

During the last year or two the R. E. T. Construction Company, Ltd., London, Eng., has installed a number of trackless trolley lines in several British cities like Leeds, Bradford and Dundee. With the inauguration of the routes at Ramsbottom, however, this company reached the point of installing complete systems instead of extensions alone. The progress of the system seems due to the superiority of the trolley to the gasoline bus in point of cost and popularity with the public, and also to the adaptability



Trackless Trolley Rounding Terminal

of the trackless trolley to narrow streets which are not suitable for tracks. The trackless car possesses the flexibility of the ordinary omnibus since it can receive and discharge passengers at the curb and swerve to the opposite side of the roadway when necessary to pass opposing vehicles. It is asserted that the investment for the system

is less than one-fifth of the capital needed for a double-track street railway of the same length when constructed under English city conditions. A feature of this company's system is that the bus may be operated easily over ordinary track sections by taking down the return circuit pole and lowering a contact shoe to the rail.



Standard Trackless Trolley Ready for Service

In general, the guiding principle of the designers of this system is to have the electrical equipment, especially the overhead apparatus, conform as nearly as possible to the standard designs of electric railways. The cars are turned at the terminus of the line by means of a simple loop as illustrated. Where this arrangement is impracticable, the vehicle may easily be turned in a street only 20 ft. wide by using a side street near the terminus for the construction, in the outward trolley wire, of a V whose apex points down the side street. In this way frogs are obviated. Where cars are operated in opposite directions on a route equipped with but one pair of overhead wires, one car lowers its trolley poles to allow the other to pass. These poles can be lowered and replaced in about ten seconds.

The accompanying views give an idea of the rural and hilly district served by the Ramsbottom vehicles, which are of the single-deck type, each with seating capacity for twenty-eight passengers. Two 20-hp motors are fitted on each car, each being connected independently to one of the rear driving wheels. The transmission is by means of chain and sprocket drive. As the motors are suspended on the chassis, they are protected from road shocks. The driver's platform is protected by a wind screen, the entrance for passengers being at the rear of the cars.

The running costs of the system at Rotherham are stated to be 11 cents per car mile. This figure included an allowance of 3 cents per car mile for tires, and as the Rotherham Corporation has placed contracts for its rubber tires at 2 cents per car mile the running costs mentioned may be reduced to approximately 10 cents per car mile. The energy consumption varies from 0.87 kw-hr. to 0.89 kw-hr., including line losses, or about 0.75 kw-hr. metered at the car.

It is also stated that the receipts of the tramway route at Rotherham which is fed by this service have gone up from 11 cents to between 20 cents and 22 cents per car mile, while the average receipts of the trackless trolley cars alone are about 20 cents per car mile, showing a handsome profit after setting aside the necessary reserve for sinking fund and interest on capital. At Leeds the cost of car operation is stated to be 13 cents, including the sinking fund and interest.

The "R. E. T." system is now being installed in South Africa, South America and China. The installation of double-deck vehicles in several important centers is also contemplated.



## SAMUEL INSULL ON CURRENT TOPICS

The first fall meeting of the Electric Club of Chicago was held at the Hotel Sherman Sept. 25, 1913. Mr. Samuel Insull, president of the Commonwealth Edison Company, of Chicago, addressed the club at this time. No subject had been selected for this address, but his talk was along the lines of electrical development prospective and retrospective. In opening Mr. Insull dwelt on the enthusiasm with which young men were solving the electrical problems, which largely explained the remarkable development of the art in late years. He cited the personnel of the Electric Club to emphasize his point and said that this characteristic was prominently displayed in a recent meeting of the Edison companies at Cooperstown, N. Y. In the end, however, the prosperity of the industry depends wholly upon the success of the consumer. No doubt great economies are possible through the concentration of production, a phase of the industry which was being rapidly brought about. A few isolated plants still exist, largely because they are unable to realize that one and one make two, as it were, or have not studied the question with sufficient care to arrive at the correct answer.

Strained financial conditions during the past year have made it extremely hard to secure new capital for development work. Consequently development has been seriously retarded, but the electric industries have not felt the restraint as much as other propositions. Conservative ventures for the development of electrical industries have had far less trouble in securing funds than equally meritorious propositions in other fields. This indicates that the electrical business, which represents an investment of practically \$250,000,000, is on a firm basis.

Mr. Insull next discussed the political situation in the State of Illinois as regards public utilities. There is a possibility of serious conditions arising in the near future

owners and operators stand ready to do all in their power to make the commission a success, and it is to be hoped that the quality of men appointed will be such as to make co-operation possible.

Another phase of the electrical industry discussed by Mr. Insull was along the lines of benefits to the communities served. He cited the great expenditure of money in Chicago following the panic of 1907 in street railway rehabilitation. A move of its magnitude at that particular time had a tendency to offset financial stringency in this territory. In closing he stated that one of the newspapers had recently stated that it was his ambition to abolish every smokestack in Chicago. While he did not remember making a statement to this effect, he stood ready to indorse it at this time. If all light, heat and power could be furnished to the city of Chicago electrically, the material saving in life and property would more than counterbalance the cost of the service.

## ELECTRIC RAILWAYS OF SOUTH AFRICA

The South African municipal year book for 1911 shows that there are now five municipalities in South Africa which own street railways, namely, Durban, East London, Johannesburg, Pietermaritzburg and Pretoria. Operations in Johannesburg and Durban showed net profits of £45,187 and £16,589 respectively, while the other cities had slight deficits due to the opening of new lines in rapidly developing territory. The cities of Cape Town, Port Elizabeth and Kimberley have privately owned street railways. It is stated that trackless trolley systems have been decided upon in the cities of Bloemfontein, Boksburg, Benoni and Germiston.

The data in the accompanying table are selected from an article in the *Tramway and Railway World* for Feb. 6, 1913.

In addition to the foregoing data, the Durban Tramways

STATISTICS ON SOUTH AFRICAN ELECTRIC RAILWAYS.

	Population	Miles of Track	Capital Expenditure	Passengers Carried	Car Miles Run	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Traffic Receipts Per Car Mile	Operating Expenses per Car Mile	Kw-Hours Used	Cost per Kw-Hour	Cars
Durban Corporation Tramways.....	69,165	32	£428,000	16,343,420	1,607,941	£113,708	£67,310	£46,398	£16,733	16.87d	10.03d	2,964,255	1.125d	77
East London Municipal Tramways....	23,500	5.9	£52,246	1,679,391	245,996	£13,506	£16,661	£13,506	£3,292	13.18d	16.25d	327,933	3.d	15
Johannesburg Municipal Tramways***..	331,869*	57	£744,538	26,632,215	2,548,177	£319,974	£196,413	£45,186	£68,776	30.13d	24.97d	5,777,261	2.05d	109
Pietermaritzburg Municipal Tramways***.....	30,539	8.5	£133,340	1,662,636	244,750	£10,747	£9,645	£1,082	£4,934	10.00d	9.46d	279,202	1.5	16
Pretoria Municipal Tramways.....	41,630	10	£150,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21
Cape Town Tramways Company....	154,000	28	.....	13,224,621	1,930,693	£130,078	£71,742	£58,336	.....	16.17d	8.92d	3,268,841	.....	78
Kimberley, Beaconsfield & Kenilworth Company***.....	.....	5.5**	.....	360,595	44,340	.....	.....	.....	.....	.....	.....	.....	4.d	12
Port Elizabeth***.....	32,000	23	£180,000	3,250,000	467,000	£32,000	£20,500	£11,500	.....	16.44d	10.53d	.....	.....	30

\*Only white population of 111,857 is carried. \*\*Three miles horse. \*\*\*Figures are for 1910.

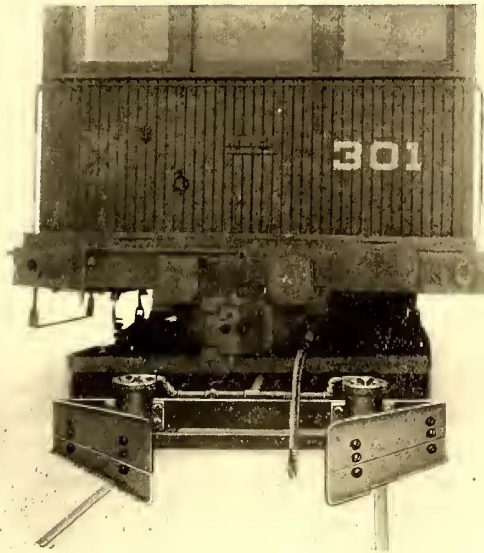
from the fact that the public utilities bill places under the control of the Governor all the utilities in the State. Unless great care was exercised in making the appointments to the Public Utilities Commission, with a view of protecting not alone the public but the utility companies as well, harm is certain to result. If the appointments are made on the basis of political reward it would result in the greatest possible detriment to the utilities of the State. He stated, however, that he had confidence in Governor Dunne and felt sure that he would exercise good judgment and appoint men from the ability standpoint. Public utility

assigned £2,766 to the sinking fund and £7,560 to depreciation and reserve; the Pietermaritzburg Municipal Tramways assigned £1,114 to the sinking fund only, while the East London Municipal Tramways assigned £2,120 to depreciation and nothing to the sinking fund. The report of the Durban Tramways for 1912 just issued shows 34 miles of track, gross earnings of £122,056, operating expenses of £72,217, net earnings of £49,839, surplus of £716 after paying capital charges and 4 per cent to the borough fund. The tramways operated 1,672,220 car miles and carried 15,655,737 passengers.



## EQUIPMENT FOR SNOW AND ICE ON INTERURBAN LINES

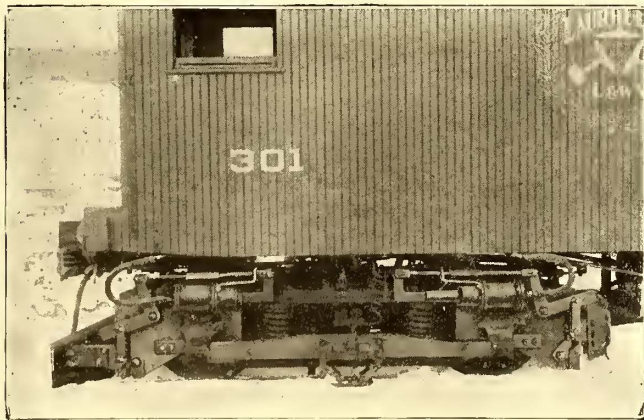
With the purpose of keeping equipment costs low, many interurban lines have attempted to minimize the importance of the interference of snow and ice in winter and thus have



Snow Removal—Air-Operated Flanger on Standard Car

limited their investments in a class of equipment which has been recognized for years on steam roads as necessary to satisfactory operation. Most managers, however, are coming to recognize that a more vigorous treatment of this phase of operation is desirable in order to avoid not only delays in the movement of traffic but also unnecessary consumption of current, and several types of snow and ice fighting devices are now available for this purpose.

Among these are several devices manufactured by the Railway Appliances Company, Chicago, and the accompanying illustration shows a combined car plow and flanger made by this company. This is a very strong and efficient device for use where the snows are heavy and subject to deep drifting in cuts. It does not merely throw the snow off the line, for a flanging device at the same time clears the rails and flanges and gives the wheels a chance for tractive effort. This plow is of steel construction through-



Snow Removal—Air-Operated Flanger for Third-Rail Line

out, framed with angle iron which is bolted to the body of an ordinary gondola car. The flanger may be hung from the plow frame so as to be applied and removed with the plow. The plow is usually about 9 ft. wide and 8 ft. to 10 ft. high to suit conditions. It weighs 3 tons or upward according to size required.

Another illustration shows a motor car flanger which has now been in service for several seasons on the Lackawanna & Wyoming Valley Railroad and was designed to throw the snow away from the third-rail in whichever direction the car might be moving. This has proved to be a very effective device for localities where much crusted snow and ice is encountered.

A third illustration shows the application of an air-operated ray flanger to an ordinary motor car. This type of

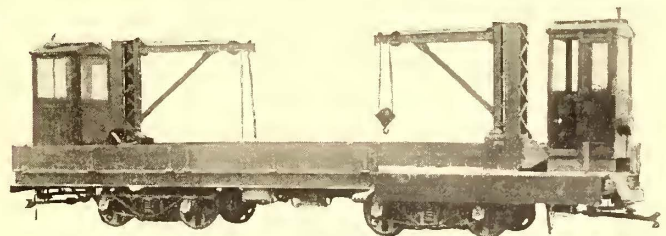


Snow Removal—Combined Snow Plow and Flanger

flanger is easily applied to any motor car truck, gasoline-electric car or electric locomotive. It is hung in guide plates securely attached to the side frames or equalizer bars of the motor truck, and the flanging blades are carried on cross-bars which move up and down in the guide plates. The blades are raised or lowered by air, the air cylinders being a part of the cross-bar assembly, and the control is by means of a three-way valve located near the hand of the motorman. When not in action the flanger is held up to the car body by a swivel connection. All of the plows and flangers illustrated can be installed and removed from the cars without difficulty.

## CONSTRUCTION CAR FOR LYNCHBURG

The tendency toward using highly efficient new equipment for service cars is indicated by the recent order of the Lynchburg (Va.) Traction & Light Company from The J. G. Brill Company for the construction car shown in the accompanying illustration. This car has hoisting equipment of 4000-lb. capacity and is used to haul rails, ties, poles, ballast, line material, etc. Hinged sides are provided to facilitate loading. The body is 40 ft. long over all and is notable for the use of an all-steel underframe. The distance between the bolster centers is 18 ft.



Lynchburg Construction Car, Showing Hoisting Equipment

6 in. The width over the sills is 8 ft. 2 in., the height from rail to sills 2 ft. 8 $\frac{3}{4}$  in. and that from the sill to the trolley base 6 ft. 10 in. Two completely inclosed cabs permit double-end operation. The body is carried on No. 50-E-1 trucks, which are furnished with four Westinghouse 101-B motors.



## GAS-ELECTRIC TRAIN FOR THE KHEDIVE OF EGYPT

A train composed of two motor cars, each equipped with a gas-electric set, was recently supplied by the Allgemeine Elektrizitäts Gesellschaft, Berlin, Germany, to the Khedive of Egypt. The coach bodies were constructed by the Metropolitan Carriage, Wagon & Finance Company, Birmingham, England. The train comprises a saloon coach and a composite coach for the suite and attendants. Each has a combustion engine, generator, motors and double-end control. It is intended to travel at 40 m.p.h. on the level, and the total train weight without passengers is approximately 100 tons.

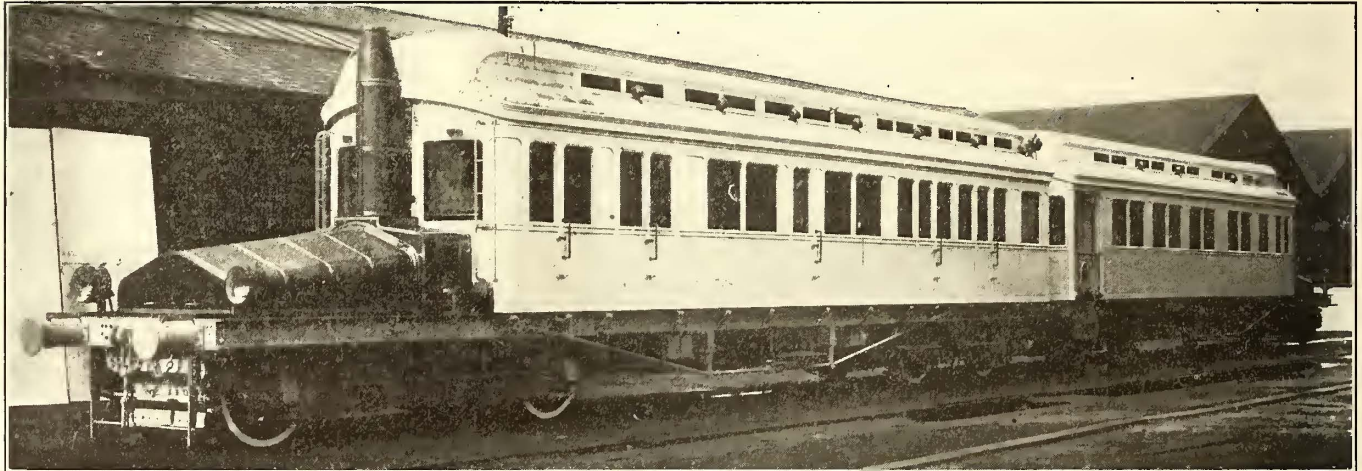
### CONSTRUCTION OF CARS

Each car is mounted on two double trucks. The gas-electric sets are carried on the trucks at each end of the train, the four motors being placed in the center trucks. The combustion engines are fixed to a special inner frame which is supported from the axles by springs, so that with the ordinary double-spring suspension of the car body from the axles, a triple-spring suspension is obtained between the car body and motor. The engine trucks are placed so far in front of the body that the engines and auxiliary machinery are completely exposed when the bonnets are removed. The electric motors are accessible through open-

reservoir is suspended from the machine truck. The fuel is kept under the pressure of a neutral gas, nitrogen or carbonic acid, which is drawn from a steel cylinder through a pressure-reducing valve, thus insuring immunity from explosion. A centrifugal governor permits the engine speed to be reduced to approximately one-third when the car is standing. A Bosch high-tension magneto is used for the ignition, a battery being provided as a reserve. The exhaust gases are led over the roof into the open air through a silencer suspended in the chimney by springs and flexibly connected with the motor.

Each generator has an hourly rating of 80 kw and a continuous rating of 50 kw, the exciter having a continuous rating of 3.5 kw. Both machines are cooled by a fan mounted on the same shaft. The normal generator pressure is 300 volts and the exciter pressure is 60 volts. The generator has commutating poles and can be overloaded at starting with a current up to 500 amp. Each car has two series-wound commutating-pole motors rated 80 hp at 300 volts on the hourly basis. The motors are geared in the ratio of 1:2.6.

The control and speed regulation is carried out in accordance with the Ward-Leonard system, namely, by regulating the generator fields. The control of both generators may be carried out in common from either cab. In the



Private Gas-Electric Motor Car and Trailer for the Khedive of Egypt

ings in the floor. The radiators are mounted on the roof above the two engineer's cabs, and the connecting pipes between the engine and radiator and the exhaust are contained in a chimney-shaped erection in the front of each car. The chief dimensions of the train follow:

	Saloon Car.	Composite Car
Length over buffers.....	60 ft. 0 in.	63 ft. 0 in.
Length of car body.....	45 ft. 5 in.	48 ft. 5 in.
Width of car.....	9 ft. 3 in.	9 ft. 3 in.
Height from rails to roof.....	14 ft. 8 in.	14 ft. 8 in.
Height inside car body.....	9 ft. 5 in.	9 ft. 5 in.

The saloon car has a reception saloon, a private saloon, a lavatory, an observation platform and an engineer's cab. The composite car contains two second-class compartments, three third-class compartments, a baggage compartment, a lavatory and a corridor leading through the whole car to the cab.

### MACHINE EQUIPMENT

The combustion engine gives a continuous output of 120 hp. at a speed of 700 r.p.m. Forced lubrication is effected by means of an oil pump. The engine is started by means of compressed air and is cooled with air-cooled water, which is circulated by a centrifugal pump. The pump drives the water through a honeycomb radiator, mounted on the roof of the car, and in addition to the natural draft when traveling, it is cooled by an electrically driven fan with a vertical shaft mounted on the car roof. The fuel

field circuit the one exciter excites the two generator fields connected in parallel, through a common resistance. One resistance is used for each direction. The two exciter fields connected in parallel are fed in like manner from an auxiliary battery with a one-hour capacity of 68 amp-hr. at 60 volts, to which the second exciter is connected in parallel. When the engine is running at a low speed this exciter is switched out automatically by a special switch, and when the speed is high it is switched in again, so that in the first case the battery works alone and in the second case it works in parallel with the exciter and can also be charged from the latter while the train is running.

The motor circuits in both cars are completely separate from one another, and the generator of one car feeds only the two motors of the same car. Safety precautions, such as fuses, overload release, deadman's handle, etc., are provided throughout. The lighting, signaling, battery ignition and other auxiliary apparatus are connected up to the battery. Should any part of the equipment develop a defect, the connections can be altered to permit the train to operate with the equipment of one car alone merely by using a throw-over switch, which is sealed in its normal position. All heavy current equipment is carried in a box under the car floor. The train is equipped with Westinghouse automatic air brakes as well as with an air sander and whistle.



## LONDON LETTER

*(From Our Regular Correspondent)*

The twelfth annual conference of the Municipal Tramways Association (Incorporated) was held in Sheffield beginning on Sept. 23 under the presidency of A. R. Fearnley, general manager of the Sheffield Corporation Tramways. An informal reception was held at Royal Victoria Station Hotel on the evening of Sept. 23. The Executive Council met on the morning of Sept. 24 at the town hall. A reception by the Lord Mayor, chairman and members of the Sheffield tramways committee followed in the Council Chamber. After the presidential address by Mr. Fearnley, a paper on "Advantages and Disadvantages of Platform Fare Collection" was read by Alderman S. Flint, chairman of the Leicester Corporation Tramways committee. The discussion was opened by Councilor J. A. Smith, chairman of the Aberdeen Corporation Tramways committee. Luncheon was served at the Grand Hotel. In the afternoon a paper on "The Maintenance of Paving on Tramway Track, as Affected by Section 28 of the Tramways Act, 1870," was read by Councilor W. C. Fenton, member of the Sheffield City Council. The discussion was opened by Councilor C. F. Spencer, chairman of the Halifax Corporation Tramways committee. During the afternoon the ladies who attended the conference with the delegates paid a visit to the silver-plate and cutlery works and showrooms of Mappin & Webb. In the evening, by invitation of the tramways committee, all of the delegates and the ladies were present at a performance at the Lyceum Theater. Supper was served after the theater at the town hall. On Sept. 25, after the meeting of the executive council and a meeting of the managers' section, a paper on "Urban Passenger Transport" was read by J. B. Hamilton, general manager of the Leeds Corporation Tramways. The discussion was opened by Alderman H. W. Littler, chairman of the West Ham Corporation Tramways committee. Luncheon was served at the Royal Victoria Station Hotel at the invitation of the tramways committee. The delegates then visited the various works in the vicinity, being transported in special cars. Many members decided to visit the plant of Edgar Allen & Company, Ltd., Hadfield's Steel Foundry Company, Ltd., and S. Osborn & Company, Ltd. Others visited the various electric supply and power stations in Sheffield. In the meantime the ladies were entertained by a motor-bus trip to Haddon Hall and Grindleford. At the latter place tea was served at the invitation of the Lady Mayoress of Sheffield. The annual dinner of the association was held at the Royal Victoria Station Hotel in the evening. The executive council and the annual business meetings were held on the last day.

The Council of Morecambe has approved the resolution of the electricity committee of the Corporation instructing the electrical engineer to prepare plans for the electrification of the tramways. At a town meeting four years ago the ratepayers declined to allow the Corporation to proceed with a bill providing for the electrification of the tramways. Morecambe still depends entirely upon a horse tramway service.

The Board of Trade has refused to authorize the Brighton Corporation to run double-decked railless trolley vehicles. There are at present no vehicles of this double-decked type in operation, though the R. E. T. Construction Company, London, has built one for experimental purposes.

The Birkenhead Corporation has decided to seek parliamentary power to run motor omnibuses in Birkenhead and the adjoining districts.

The urban districts of Bolton, Wath, Thurnscoe and Wombwell are promoting a bill for a permanent tramway service to connect the centers in the valley of the Dearne. This action was prompted by the Swinton Tramway withdrawing the places referred to from its railless traction bill.

The Swansea Tramways, which leases the Mumbles Railway, contemplates electrifying the line at an expense of £60,000. The intention is to run a regular ten-minute service from Rutland Street to the pier.

The Sheffield tramways committee has decided to grant the application of the Sheffield University Council for aid in extending the university buildings in Western Bank to meet the immediate requirements of the science and art departments and has recommended that the City Council do-

mate £1,000 a year from the funds of the tramways undertaking for a period of ten years. The committee has also decided to allow children under five years of age to travel free on the tramways and to charge half fare to persons between the ages of five and fifteen years.

C. W. Mallins, general manager of the Liverpool Corporation Tramways, has reported on the question of contract tickets, transfer tickets and cheap fares for children. He communicated with most of the municipalities and eighty-four replied, eighty-one of which do not issue contract tickets. All consider that it is impossible to appraise the value of such a ticket. In the case of one company which reported to Mr. Mallins the practice of issuing contract tickets was discontinued owing to abuse and consequent financial loss. One corporation reported that it is losing at least £1,500 per annum on such tickets. With regard to transfer tickets, of the same eighty-four tramway authorities, forty-eight issue no transfer tickets, and twenty-four undertakings which do issue transfer tickets do not recommend their adoption. Most of the authorities reported that they arrange the fares for children in accordance with local conditions. A number adopt the practice of charging half fares for children between the ages of three and ten years, and in some cases up to twelve and fourteen years of age. A number of other communities, including London and Liverpool, do not charge for children under five years, but over that age charge full fare. Liverpool makes a further concession when special cars are hired for the conveyance of children, but on the whole no uniform practice has been adopted by the various municipalities.

The London County Council appears well satisfied with the experimental petrol-electric tramcar which it placed in service recently. The car is in use on the 3-mile tramway from Stepney to the East India Dock.

The serious decline in the profits of the London County Council tramways has induced the County Council to appeal to the assessment committee for a reduction of its assessment. At present the Council pays rates amounting to about £100,000 a year to the various local authorities through whose jurisdiction the tramways pass. The local rates would, of course, be affected by any reduction in the tramway assessment, as the deficiency would have to be made up by the authorities in some other way.

The new Hagley Road tramway of the Birmingham Corporation has been officially inspected by Major Pringle on behalf of the Board of Trade, and it has now been put into service.

George Balfour, of Balfour, Beatty & Company, has offered £32,892 to the Stirling Town Council for the Stirling tramways and the electric light undertaking. The Stirling tramways are operated with horses.

The linking up of the three electric railways at Charing Cross will probably be completed within the next few months. This work will connect the District Railway, the Bakerloo and the Hampstead tubes physically and obviate the present walk from the Charing Cross station of the Metropolitan District Railway to the Charing Cross station of the Hampstead tube, and the long walk underground from the Embankment station of the Bakerloo tube to the platform of the Metropolitan District Railway. In a month or so trains will run from Hampstead to the Embankment and discharge passengers at platforms almost on a level with those of the Bakerloo station, which will be situated beneath the new District station. A new escalator is being installed to connect the three stations.

Work on the electrification of the new London & North-western Railway from Euston to Watford is progressing. The conversion of the suburban lines of the London & Southwestern Railway is now under way. The extension of the Baker Street & Waterloo Bridge Railway from Edgware Road to Paddington has been completed, and it is probable that trains will be running to Paddington before the end of the year. The extension of the Baker Street & Waterloo Railway from Paddington to a junction with the London & North-western electric line at Queen's Park, Willesden, is well advanced, and it is likely that within twelve months underground trains will have access to this important main line. The plan to run these trains to Watford cannot, however, be carried out until the London & North-western Railway's central station and electrification have been completed.

A. C. S.



# News of Electric Railways

## General Suggestions for Railroad Valuation

In connection with the general subject of railroad valuation a sheet of suggestions in diagrammatic form as to inventory and information to be obtained under the valuation act has been issued by Thomas W. Hulme, general secretary of the presidents' conference committee.

The first item suggested is improvements, with an analysis of the methods by which original cost with additions, cost of reproduction and cost of reproduction less depreciation are obtained, and the reasons for their differences, if existent. Supplemental to this it is recommended that other values and elements of values be analyzed as to methods of valuation employed and reasons for any differences between such values and the foregoing costs.

Land, right-of-way and terminals used for common-carrier purposes are proposed for consideration next, original cost being compared with present value, and in the case of land acquired by condemnation the original cost is to be compared with the present cost. The third classification pertains to property held for purposes other than for those of a common carrier, and with such property it is proposed that original cost and present value be obtained, with an analysis of the methods of valuation employed.

Fourthly, financial matters are recommended for consideration, subdivided into (1) history and organization of present and previous corporations operating any part of the property; (2) increases or decreases of stocks, bonds or other securities in reorganization; (3) moneys received by any of the corporations by reason of any issue of stocks, bonds or other securities; (4) moneys for syndicating, banking or other financial arrangements under which such stocks, bonds or other securities were issued, and the expense thereof; (5) gross and net earnings of each present and previous corporation; (6) expenditures of all moneys in such detail as the Interstate Commerce Commission may require, and the purpose thereof, and (7) such other elements as the commission may require to ascertain the original cost to date.

In the fifth and last group are placed for consideration the amount and value of any aid, gift, grant of right-of-way or donation made to the reporting carrier or to any predecessor by any government, individual or others; grants of land and the amount derived from the sale of portions thereof; value of the unsold portion at the time of acquirement; value of the unsold portion at the present time, and the amount and value of any concession and allowance made to the United States or to any State, county or municipal government in consideration of any aid, gift, grant or donation.

## Mr. McCall on Rapid Transit Matters

Edward E. McCall, chairman of the Public Service Commission of the First District of New York, who is the Democratic candidate for Mayor of New York, was quoted in part as follows in regard to rapid transit matters in New York in a full-page interview with him which appeared in the editorial section of the *New York World* of Sunday, Sept. 21:

"The matter of the financing of the new subways has led to a great deal of acrimonious discussion. I will not go into that question at present further than to express the opinion, after a very careful consideration of all the circumstances of the case, that on the whole the contracts which have been signed are substantially fair and that they properly protect the city's interest.

"The question is a very complicated one and one in regard to which honest men may well hold conflicting views. My feeling is that those who have most strenuously opposed the contracts have not attached sufficient weight to the two factors which finally led to the action which was taken. In the first place the conditions of the passenger traffic on our subway and elevated systems had become so bad that the need for immediate action was imperative. On this ground alone some sacrifice of the utmost advantage obtainable by the city on the financial side of the transaction would

have been justifiable, though personally I do not believe that any material sacrifice was made.

"In the second place the difficulties in the way of raising funds to carry out the project as a municipal undertaking were insuperable. I paid very careful attention to this phase of the question and became absolutely convinced that there was no way out in that direction.

"I may say that in regard to subways and all other public improvements I favor in a general way such plans of financing as will make a fair division of the burden between the present and the future taxpayers of the city. It does not seem fair to me that the taxpayers of to-day should be called upon to bear the whole expense of improvements whose advantages will be enjoyed by a new generation of citizens over a long period of years.

"In the matter of transportation the element which surpasses all others in importance and urgency is that of carrying the people between their homes and their business quickly, safely and comfortably, and if this condition can only be realized by heavy expenditure that expenditure will have to be incurred upon the best terms obtainable."

## From New England to the Convention by Trolley

The New England Street Railway Club is perfecting the plans for the trip by trolley from New England to the convention in Atlantic City, to which reference has been made previously in the *ELECTRIC RAILWAY JOURNAL*. A number of the companies are fitting up special cars for the purpose. Schedules will be arranged to operate cars from various points to New London, Conn., picking up those who wish to go along the way. Outside of New London, the principal points of centralization will be Boston and Worcester. Some cars will leave Boston on Oct. 12 at 8.45 a. m. and go to New London via Brockton, Taunton, Providence, Danielson and Norwich. Some will go from Boston to Worcester and to New London. Other cars will go direct from Worcester.

At 11 p. m. a boat of the Norwich line will leave New London for New York, arriving in New York at Pier 40 at 7 a. m., Monday, Oct. 13. At New York a train will be taken which will reach Atlantic City at 1.15 p. m. Lunch will be served on the cars to New London. Arrangements will be made to take care of baggage and staterooms on the boat will be reserved. Special attention will be paid to arrangements for the pleasure and comfort of the ladies.

For the purpose of arriving at some definite figure of cost, it has been decided to fix the trolley fare to New London, including an attractive buffet lunch on the cars, at \$3. The fixed charges follow:

Boston or Worcester to New London, including lunch.....	\$3.00
Boat, New London to New York.....	1.50
Stateroom on boat (as desired).....	1.00 or 2.00
Round trip, New York to Atlantic City.....	5.00
Parlor car, New York to Atlantic City.....	0.75
Transfer of baggage (approximately).....	0.50

Those who desire to make the trip from New England by trolley are requested to write to H. A. Faulkner, the secretary of the club, to let him know how many will go and to send check, payable to E. P. Shaw, Jr., treasurer of the club. Those who decide to go by trolley will be notified later as to the exact plans.

## The Question of Hours of Employees in Cleveland

At the instigation of the city solicitor's department, the Cleveland City Council at its regular meeting on Sept. 23 refused to hear complaints from the street railway men regarding the hours they are compelled to work and the effect the present schedules have on their time. Peter Witt, street railway commissioner, had advised the Council that the city had nothing to do with the working hours of the men or the schedules upon which cars are operated, and he was supported in this by the city solicitor's department. This was done in the face of protests from the men that Mr. Witt is responsible for the schedules now in operation and that they make it impossible for the men to have their proper layovers and force extra men to be on duty long hours for only short periods of work.



The men, following the action of the Council, threatened to take the matter before the Cleveland Federation of Labor in an effort to force the city to take steps for the betterment of the working conditions. They said that one-fourth of the men are compelled to work from twelve to eighteen hours a day at from 75 cents to \$1.50 a day. The statement was also made that thirty men gave up their places in one day recently because of these conditions, and that since Jan. 1 as many as 500 men have resigned for the same reason.

It is probable that this matter will now be taken to John J. Stanley, president of the company. Mr. Stanley has expressed a willingness to meet the men, but is unable to see where he can improve matters under the schedules in use at present. It is possible that the men may ask for arbitration on their demands for improved conditions, but it would seem that as long as the city holds the company to the present schedules and headway it will be impossible to effect a change for the better, whatever the decision of a board of arbitration might be.

#### Results of Pooling Receipts in New York for the First Month

Edward E. McCall, chairman of the Public Service Commission for the First District of New York, has announced the result of the first month's pooling of receipts under the operating provisions of the dual system contract with the New York Municipal Railway Corporation (Brooklyn Rapid Transit). This company is the first to go under the terms of the new contracts by reason of its commencement of the operation of the Centre Street loop subway. This is a four-track subway, but the Brooklyn company is operating only two tracks. The company has been able to take trains off the Brooklyn Bridge and send them over the Williamsburg Bridge and through the loop subway to the City Hall, Manhattan, thus relieving materially the congestion at the Manhattan terminal of the Brooklyn Bridge.

Under the operating contract the earnings of all the Brooklyn elevated lines and the Centre Street loop are pooled. From the gross earnings the company deducts rentals, taxes, operating expenses, allowances for depreciation, and a certain amount known as the "preferential," which is paid to the company in lieu of the profits it derived from its existing lines at the time of making the contract with the city. After these deductions are made the surplus is to be devoted to paying interest and sinking fund charges upon the city's investment. In the case of the Centre Street loop the city's investment upon that portion now in use is estimated at \$6,500,000.

For the first month of operation of this loop the company reported a total revenue of \$722,271. After making the deductions for expenses, taxes, depreciation and the preferential there was left a balance of \$22,870, which was more than enough to pay the interest on the city's investment and within \$2,814.52 of the sinking fund as well.

#### Akron Ordinance for Municipal Ownership Laid Over

At the regular meeting of the City Council of Akron, Ohio, on the evening of Sept. 24, the ordinance providing for the issue of \$225,000 of bonds for the purpose of building a municipal railway line was laid on the table by a vote of seven to four, to await the report of a committee of citizens which has taken the matter to the officials of the Northern Ohio Traction & Light Company. Councilman Shaw, who made the request for delay in action on the ordinance, expressed the belief that the company will make a proposition for extensions and improvements which the Council will be willing to consider. He said, however, that he will vote for the bond issue if the company does not take such a step within a week from the date of the meeting.

A. C. Esch, Socialist member of the Council, has announced that he will circulate petitions to initiate an ordinance providing for municipal ownership. It will be necessary to secure the signature of 30 per cent of the electors in order to have an initiative vote on the question. If the petition is successful, the matter will come up at the regular election in November.

#### R. P. Stevens on Regulation

R. P. Stevens, the retiring president of the Lehigh Valley Transit Company, Allentown, Pa., concluded in part as follows the address which he made at the banquet tendered to him recently by the newspaper men of Allentown and Bethlehem:

"I thank God that the newspaper men of the Lehigh Valley are broad-minded, are able to look to the future and do not throw away sound principles and good judgment in order to satisfy a temporary, feverish desire of small unthinking groups who do not know what they want and, in order to get what they think they want, would undermine the very industries which are essential to their welfare.

"I think more combined effort should be made to make the people realize that the electric roads are an essential part of every community, that they are an absolutely necessary adjunct to business and that anything done to hinder them or impair their credit, or to prevent the sale of their securities, is a blow to the people themselves.

"I firmly believe in legislation for the public utilities and in government regulation, provided the motive is in the interest of progress and betterment, and not political, but this legislation should be reasonable, practical, clear and effective and should not be planned during the height of agitation.

"I think the fear on the part of the public utility managers at present is not so much for what has been done, but because of the manner and temper in which it was done and for fear of what may come in the future. It is not certain in my mind that the mixture of private ownership and public regulation which is now prevalent will succeed. It is contrary to all rules of political economy and all teachings of history.

"Started as a purely private industry, our public utilities have been appropriated in part, and other parts are apparently to follow, and, granting whatever may be claimed for the advantages of regulation by government, do not equity and ordinary commercial decency require that such close restriction and supervision as are required by some of our public utility laws should be continued by some guarantee or return on the investment?"

#### Results with Low Fare in Detroit

The fare of seven tickets for 25 cents went into effect on the lines of the Detroit (Mich.) United Railway on Aug. 15 and the old rate was collected for the first fourteen days of the month. The company reported gross earnings of \$1,121,125 for the month, as against \$1,031,761 for the corresponding month of 1912, a gain of \$89,364, or 8.66 per cent. The third week of August, or the first week the low fare agreement was in operation, the gross earnings were \$246,466, as compared with \$231,430 for the corresponding week a year ago, a gain of \$15,036. The fourth week showed \$255,141, a gain of \$14,095 over the corresponding week in 1912. The increase in gross earnings for the first week in September was \$3,268 over the same period in 1912.

The Common Council on the evening of Sept. 23 adopted a resolution, presented by Alderman Lodge, providing for the extension of the Fourteenth Street line to the new Michigan Central station, but making the fare eight tickets for 25 cents on the old Pingree cars. It is believed that the company will refuse to accept the proposition because of the rate of fare provided.

#### Tentative Franchise in Des Moines

The terms of the franchise which the city of Des Moines, Ia., will submit to the officers of the Des Moines City Railway as the basis of negotiations looking toward an extension of the present grant of that company have been decided upon by the city officials, and H. M. Byers, corporation counsel of the city, has been instructed to redraft the proposed grant. Important provisions of the tentative franchise agreed upon recently follow:

Franchise tax approved—to be voted on separately; city to receive 2 per cent of gross earnings for first five years; 3 per cent of earnings for second five years; 4 per cent for



third five years, and 5 per cent for last ten years the franchise will run.

After reaching the maximum of dividends to be allowed the company, all surplus shall go to reduce fares instead of to amortize the capital value.

City Council shall approve all compromises of personal injury cases. Company must give city right of way to open Ingersoll Avenue from Seventeenth to Twenty-eighth street.

Council shall approve arrangements to insure property.

Permission given company to use all viaducts.

Company shall spend \$1,500,000 to rehabilitate the system.

Special provision for extra cars at rush hours.

Plan to purchase system, if people sanction municipal ownership.

Company shall incorporate in Iowa and keep its books in Des Moines.

Company is given thirty instead of fifty days to accept this franchise.

### Progress with Toronto Safety Campaign

The members of the Ontario Safety League, organized to prevent street accidents, met at the City Hall in Toronto on Sept. 23 and formed a tentative membership plan. It is intended to have two classes of members—associates, comprising the younger generation, who will be supplied with celluloid emblem buttons and will be expected to do missionary work in the schools but will pay no fees, and sustaining members, who will pay a fee of \$1. It is also planned to raise funds by contribution from various public bodies and from wealthy individuals. Walter McRae, superintendent of motive power of the Toronto Railway, outlined the publicity plan. Buttons and literature are to be distributed, and there will be a campaign of advertising by poster and in the newspapers. A form of covenant will be drawn up for the children to sign.

In furtherance of the purpose of the league the Toronto Railway inserted the following advertisement in all the Toronto daily papers of Sept. 26, over the name of James Gunn, superintendent:

"IT IS TREACHEROUS.

"What railroad people call a 'greasy' rail is a most treacherous and dangerous thing to deal with.

"The wheels won't grip on a 'greasy' rail. The car will slide as though on ice. Hence the danger.

"A car may pass a certain rail and find it clear of 'grease.' Half an hour later another car may come along and with locked wheels skid over it like a toboggan. Hence the word 'treacherous' is used.

"This is the time of year when 'greasy' rail is to be expected in Toronto. The frost causes it. Sometimes a heavy rain or a fall of soft snow will clear the rails for a few days in the winter. As a general rule, though, 'greasy' rail may be looked for as long as the frost lasts.

"Through this season drivers of all sorts of vehicles, and, indeed, foot passengers as well, ought to be very careful about crossing in front of moving street cars.

"A motorman may intend to stop, as the driver expects him to. But a strip of 'greasy' rail is likely to upset all his calculations. It may be that he cannot stop, that all the brakes in the world can't stop him.

"In the time of 'greasy' rail the wise thing to do is not to cross in front of a car because you expect it to stop. Wait until it does stop.

"Don't put it up to the motorman.

"Look after yourself.

"Safety first."

### Inspection of New Line Between Dallas and Waco

The Southern Traction Company, Dallas, Tex., sent invitations to stockholders for an inspection trip on Sept. 30 over its line recently completed between Dallas and Waco, Tex. The inspection trains were to consist of two cars each, and were to leave Dallas and Hillsboro, Tex., in the morning. The Dallas train was to be accompanied by the following officers of the Southern Traction Company: J. F. Strickland, president; R. B. Stichter, general manager; Burr Martin, president Southern Engineering & Construction Company; Luther Dean, chief engineer Southern En-

gineering & Construction Company, and D. G. Fisher, assistant to the general manager. The Hillsboro train, consisting of two sections of two cars each, was to be run under the supervision of James P. Griffin, general passenger agent, and Howard Williams, Waco ticket agent, in charge of one train and H. I. Gahagan, treasurer of the Southern Traction Company, in charge of the other train.

### New Officers of Lehigh Valley Transit Company

At a meeting of the board of directors of the Lehigh Valley Transit Company, Allentown, Pa., held on Sept. 29, Col. Harry C. Trexler, Allentown, was elected chairman of the board of directors, Harrison R. Fehr was elected president of the company, vice R. P. Stevens, resigned, and Edward M. Young, Allentown, was elected vice-president of the company, in place of Colonel Trexler, who had formerly held that office. The officers and board of directors as now constituted follow: President, Harrison R. Fehr; vice-president, Edward M. Young; secretary and treasurer, Charles M. Wagner; auditor, C. M. Walter; Charles H. Bean, John C. Dawson, George H. Frazier, Charles E. Ingersoll, Charles M. Schwab, Edward B. Smith, Warren C. Wilbur, Edward M. Young, H. R. Fehr, Col. Harry C. Trexler, chairman of the board.

### Chicago Subway Report

Construction of a two-level subway without grade crossings with the \$16,000,000 the city now has available, and with which the courts have decided it has the power to proceed under the 1907 traction ordinances, is the chief recommendation in a report completed on Sept. 26 by Bion J. Arnold, chairman of the Board of Supervising Engineers, Chicago, Traction.

The report, which was designed to apply to a subway for the surface lines only, but which the author considered inseparable from a subway for through routing elevated trains, shows clearly that the congested downtown district is overtaxed by passengers, and that this condition is growing worse rapidly.

A subway for the congested district, instead of the comprehensive scheme, is specified in Mr. Arnold's report, but he would have it built along such lines that in the future when the city is ready to extend it could be used as the nucleus of a larger system.

**Abolishing the Cable in Kansas City.**—The Metropolitan Street Railway, Kansas City, Mo., shortly will abolish the old cable system, which at one time was used almost exclusively. Only one cable line remains in operation at present, running on the west side of Twelfth Street over what is known as the "Bottoms." This is to be eliminated following the Stock Show late in October. Whether the Twelfth Street line will run entirely across the city, eliminating the necessity of a transfer system, as at present, has not been decided.

**The Question of Extension in Toronto.**—The Ontario Railway Board decided on Sept. 24 to appoint an independent traffic expert to investigate and report upon the advisability of the board ordering the Toronto Railway to change routes, add new ones and increase the number of cars. Pending the receipt of this report the board's engineer will look into the delay in the completion of the Teraulay Street line. Despite Corporation Counsel Geary's argument the board declined to issue an order for the construction of the Bloor Street line, agreeing with the declaration of counsel for the company that the line could not be started until next spring in any event, and that if the board delayed making an order until its expert was heard from no time would be lost by the company in carrying out the work.

**Service and Labor Questions in Kansas City.**—Mayor Green of Kansas City, Kan., explained his attitude in regard to express service between Kansas City, Mo., and Kansas City, Kan., in a recent address before the Mercantile Club of Kansas City, Kan. The Mayor stated that both the inter-city viaduct and a structure across the West Bottoms were available for the express service. Mayor Green also wants the principal street car lines to be routed through the main



business streets on the Kansas side, believing that the interests of the city would be furthered by such a method. Organized labor at a recent meeting adopted a resolution providing for recognition by the Metropolitan Street Railway, Kansas City, Mo. A committee of five men was appointed to appear before the franchise committee of the Kansas City Council and present the demands of the union sympathizers.

**Bids for Rapid Transit Construction in New York.**—Engineers of the Public Service Commission for the First District of New York are pushing work on plans for the various sections of the dual system of rapid transit. As fast as plans for given sections are completed the commission advertises for bids for construction. On Oct. 1 bids were received for the construction of the first section of the Seventh Avenue subway in Manhattan to be put under contract, and within two months actual work should begin on that important line. The Seventh Avenue subway is the new West Side line which will be provided for operation by the Interborough Rapid Transit Company. It will begin at Times Square (Forty-second Street), where it will connect with the existing subway, and run southward to the Battery and to Brooklyn. Work on the plans for the other sections is approaching completion and within a few months the whole line ought to be under contract. When it is completed trains from northern Manhattan and the Bronx through the existing subway may be operated from Forty-second Street over the new line to lower Manhattan instead of down the East Side as at present. There will be three express stops in Manhattan below Times Square, at Chambers Street, Fourteenth Street and the Pennsylvania Railroad Station.

**Unprofitable Extension Sought in Tacoma.**—The Commercial Club and Chamber of Commerce of Tacoma, Wash., has made public the correspondence between it and the Tacoma Railway & Power Company in regard to the construction of an electric railway to serve the district known as the tideflats. Jacob Furth, president of the Puget Sound Traction, Light & Power Company, explains that the company desires the city to construct the line and turn it over to the company for operation. Mr. Furth in a letter to the Chamber of Commerce says in part: "We still think that if the city would build a line and turn the operation of the line over to our company the industrial district could be developed, and even if there should be a loss in the operation it would be small if carried by all the people, but it does not seem to us quite fair that one company should be required to sustain the loss which the construction and operation of the line would doubtless involve. The principal reason why our company is not earning sufficient for the investment is the long haul and the large mileage of the city of Tacoma. At the conference we stated the facts practically as I am stating them here. At that time it was understood that we made an offer to throw our books open to an examination by your committee. I assure you that we have no disposition to hide anything."

**President Elliott for Full Publicity.**—Howard Elliott, president of the New York, New Haven & Hartford Railroad, in a letter to Governor Foss of Massachusetts, which was made public on Sept. 29, answered the criticism of expenditures by the road for "personal services" in the period substantially covered by the last session of the Legislature by the statement that the apparent fault lay almost entirely in the manner of reading the reports filed with the Public Service Commission. President Elliott concluded his letter as follows: "I agree with you wholly that the public has a right to know that all expenditures made by the railroad are proper and for legitimate purposes for the maintenance, operation, and care of the railroad, and that the commissioners have a right to know all the details necessary to satisfy them as to this point. If the company has not furnished the Public Service Commission with complete information, and the commission will indicate just what additional data are required, I will see that the facts are produced so far as the records of the company permit. The management of the New Haven and New England companies, as represented by me—and I believe I speak in this for the board of directors—desires to manage and operate the properties in harmony with the laws of the land, and to co-operate with the public authorities."

# Financial and Corporate

## Stock and Money Market

Sept. 29, 1913.

Trading on the New York Stock Exchange was dull at the opening and price changes were insignificant. During the early afternoon the market recovered, but on light trading in the late afternoon it closed weak. Interborough-Metropolitan preferred scored an advance. The sales for the day totaled 312,877 shares. Rates in the money market to-day were: Call, 2¾@3 per cent; sixty days, 4¼@4½ per cent; ninety days, 4½@4¾ per cent; four months, 4¾@5 per cent; five and six months, 4½@5 per cent.

The weakness in New York was reflected in Philadelphia and practically discouraged all demand for local issues at the opening. The market was broad but the volume of sales was very small.

The Chicago market was extremely narrow and weak to-day. There was very little demand for bonds.

The Boston market was quiet and weak to-day. There was no great selling pressure and no aggressive buying.

The sales of stock in Baltimore to-day totaled only 584 shares. The demand for bonds was good, the sales totaling \$54,000, par value.

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

	Sept. 24	Sept. 30
American Brake Shoe & Foundry (common).....	92½	90
American Brake Shoe & Foundry (preferred).....	135	131½
American Cities Company (common).....	37½	36
American Cities Company (preferred).....	65	66
American Light & Traction Company (common).....	354	353
American Light & Traction Company (preferred).....	105	105
American Railways Company.....	39¾	39¾
Aurora, Elgin & Chicago Railroad (common).....	42	41
Aurora, Elgin & Chicago Railroad (preferred).....	84	83
Boston Elevated Railway.....	86½	86½
Boston Suburban Electric Companies (common).....	7	7
Boston Suburban Electric Companies (preferred).....	56½	56½
Boston & Worcester Electric Companies (common).....	a10	*10
Boston & Worcester Electric Companies (preferred).....	43	43
Brooklyn Rapid Transit Company.....	89¼	89
Capital Traction Company, Washington.....	116	115
Chicago City Railway.....	165	150
Chicago Elevated Railways (common).....	25	20
Chicago Elevated Railways (preferred).....	75	75
Chicago Railways, ptcptg., ctf. 1.....	94	93
Chicago Railways, ptcptg., ctf. 2.....	30¾	30
Chicago Railways, ptcptg., ctf. 3.....	8	8
Chicago Railways, ptcptg., ctf. 4.....	3	3
Cincinnati Street Railway.....	120	107¾
Cleveland Railway.....	102½	102½
Cleveland, Southwestern & Columbus Ry. (common).....	*5½	*5½
Cleveland, Southwestern & Columbus Ry. (preferred).....	*28¼	*28¼
Columbus Railway & Light Company.....	18	18
Columbus Railway (common).....	a69½	69½
Columbus Railway (preferred).....	88	88
Denver & Northwestern Railway.....	*104	*104
Detroit United Railway.....	69	69
General Electric Company.....	146	146½
Georgia Railway & Electric Company (common).....	117	117
Georgia Railway & Electric Company (preferred).....	87	87
Interborough Metropolitan Company (common).....	15¾	15¾
Interborough Metropolitan Company (preferred).....	60¾	61¾
International Traction Company (common).....	*30	*30
International Traction Company (preferred).....	*95	*95
Kansas City Railway & Light Company (common).....	22	22
Kansas City Railway & Light Company (preferred).....	30	30
Lake Shore Electric Railway (common).....	*5	*5
Lake Shore Electric Railway (1st preferred).....	*89	*89
Lake Shore Electric Railway (2d preferred).....	*24	*24
Manhattan Railway.....	130	133
Massachusetts Electric Companies (common).....	14	13¾
Massachusetts Electric Companies (preferred).....	a68	67
Milwaukee Electric Railway & Light Co. preferred).....	95	95
Norfolk Railway & Light Company.....	*27½	*27½
North American Company.....	73	72
Northern Ohio Light & Traction Company (common).....	63	63
Northern Ohio Light & Traction Company (preferred).....	97	97
Philadelphia Company, Pittsburgh (common).....	43¾	42¾
Philadelphia Company, Pittsburgh (preferred).....	40	40
Philadelphia Rapid Transit Company.....	23	22¾
Portland Railway, Light & Power Company.....	55	55
Public Service Corporation.....	114	112
Third Avenue Railway, New York.....	42½	42
Toledo Traction, Light & Power Company (common).....	a30	30
Toledo Traction, Light & Power Company (preferred).....	a80	80
Twin City Rapid Transit Co., Minneapolis (common).....	106	105
Union Traction Company of Indiana (common).....	*5	*5
Union Traction Company of Indiana (1st preferred).....	*80	*80
Union Traction Company of Indiana (2d preferred).....	*20	*20
United Rys. & Electric Company (Baltimore).....	267½	265½
United Rys. Inv. Company (common).....	22	20
United Rys. Inv. Company (preferred).....	40	40
Virginia Railway & Power Company (common).....	56	53
Virginia Railway & Power Company (preferred).....	94	94
Washington Ry. & Electric Company (common).....	89	89½
Washington Ry. & Electric Company (preferred).....	89½	89½
West End Street Railway, Boston (common).....	70	71
West End Street Railway, Boston (preferred).....	88	89
Westinghouse Elec. & Mfg. Company.....	70½	69¾
Westinghouse Elec. & Mfg. Company (1st preferred).....	115	110

\*Last sale. a Asked.



## ANNUAL REPORTS

## Boston &amp; Worcester Electric Companies

The Boston & Worcester Electric Companies, Boston, Mass., the corporation which controls through stock ownership the Boston & Worcester Street Railway, has issued the following comparative statement of income, profit and loss for the years ended June 30, 1912 and 1913:

	1913	1912
<b>Income:</b>		
Dividends on Boston & Worcester Street Railway shares owned	\$50,625	\$50,625
Other income	19,057	18,964
<b>Total income</b>	<b>\$69,682</b>	<b>\$69,589</b>
<b>Disbursements:</b>		
Dividend of \$1 per share on preferred shares payable Jan. 1, 1913	\$33,936	\$33,936
Dividend of \$1 per share on preferred shares payable July 1, 1913	33,936	33,936
Miscellaneous expenses	1,388	1,113
<b>Total disbursements</b>	<b>\$69,260</b>	<b>\$68,985</b>
Surplus for year	\$422	\$604
Surplus brought forward	14,495	13,891
<b>Total surplus</b>	<b>\$14,917</b>	<b>\$14,495</b>

The statement of income, profit and loss of the Boston & Worcester Street Railway for the years ended June 30, 1912 and 1913, is as follows:

	1913.	1912.
<b>Revenue from transportation:</b>		
Passenger revenue	\$631,168	\$607,611
Mail revenue	451	451
Freight and express revenue	24,938	.....
Miscellaneous transportation revenue	200	200
<b>Total revenue from transportation</b>	<b>\$656,757</b>	<b>\$608,262</b>
<b>Miscellaneous revenue:</b>		
Rental of buildings and equipment	\$4,079	\$3,761
Advertising privilege	1,410	1,410
Trackage and power rental	1,119	3,718
Other miscellaneous revenue	5,572	2,770
<b>Total miscellaneous revenue</b>	<b>\$12,180</b>	<b>\$11,659</b>
<b>Total revenue</b>	<b>\$668,937</b>	<b>\$619,921</b>
<b>Expenses of operation:</b>		
For conducting transportation:		
Electric motive power	\$77,066	\$72,626
Wages of men conducting transportation	102,861	86,737
Other transportation expenses	29,926	17,761
<b>Total</b>	<b>\$209,853</b>	<b>\$177,124</b>
For maintenance:		
Repairs to track, roadway and line	\$72,889	*\$63,286
Repairs to buildings	1,536	3,188
Repairs to rolling stock and miscellaneous equipment	51,859	64,005
Repairs to power plant equipment	6,699	5,577
Removal of snow and ice	819	1,816
<b>Total</b>	<b>\$133,802</b>	<b>\$137,871</b>
For general expense:		
Salaries of officers and clerks	\$24,287	\$19,831
Damages	20,137	12,156
Insurance	9,893	7,985
Advertising	7,735	3,499
Printing, tickets and stationery	2,448	1,794
Track rental	836	659
Miscellaneous general expense	8,857	7,482
<b>Total</b>	<b>\$74,192</b>	<b>\$53,406</b>
<b>Total expense of operation</b>	<b>\$417,847</b>	<b>\$368,401</b>
Net revenue above operation	\$251,090	\$251,521
Interest on funded and floating debt	124,241	123,450
Taxes	47,971	48,321
<b>Total deductions</b>	<b>\$172,212</b>	<b>\$171,771</b>
<b>Net surplus for year</b>	<b>\$78,878</b>	<b>\$79,751</b>
Dividends on preferred stock	23,687	18,344
Dividends on common stock	50,625	50,625
<b>Total dividends</b>	<b>\$74,312</b>	<b>\$68,969</b>
<b>Surplus for year after dividends</b>	<b>\$4,566</b>	<b>\$10,780</b>

\*Including reconstruction item of \$6,963 deducted from surplus in the annual report for 1912.

William M. Butler, president of the company, says:

"The gross passenger earnings of the street railway show an increase for the year of approximately \$24,000, or about 4 per cent over the previous year, which indicates a steady growth in the territory served by the lines of the company.

"The general upkeep of the property of the street railway has been carefully looked after, \$72,889 having been expended for the past year on track, roadway and overhead lines, or an average of \$885 per mile of track owned. In comparing the amounts expended by various other street railway companies throughout New England, it appears that this company has been liberal in its expenditures for this account, and it is believed that the amount

spent during the past year represents the maximum of expenditure required for this purpose.

"A tie-treating plant has been purchased, and practically all new ties that are now being laid are chemically treated, which should materially prolong their period of usefulness.

"The block signal system, which has been in process of installation during the past three years, has now been practically completed.

"A freight and express service was inaugurated on the lines of the company about Jan. 1, arrangements having been made with the Boston Elevated Railway and the Worcester Consolidated Street Railway for terminal facilities in both Boston and Worcester. Freight and express stations have been established in various cities and towns in which the company operates, together with necessary track connections, and sufficient freight and express equipment has been provided. This service has not been established long enough to justify a prediction as to its value, but the management is diligently at work to develop it in order to make it a profitable addition to our business.

"The company issued \$140,000 additional first mortgage bonds during the year, the sale of which reduced the floating debt to \$175,000. This floating debt is held by the Boston & Worcester Electric Companies, and the street railway still continues independent of outside borrowing."

## American Public Utilities Company

The board of directors of the American Public Utilities Company, Grand Rapids, Mich., has submitted to the stockholders the following partial comparative income, profit and loss statement for the two years ended June 30, 1911, and June 30, 1912:

	1913	1912
Gross earnings from operations	\$1,981,320	\$1,738,192
Operating expenses	1,071,621	964,642
<b>Net earnings from operations</b>	<b>\$909,699</b>	<b>\$773,549</b>
Miscellaneous income	64,627	.....
<b>Gross income</b>	<b>\$974,326</b>	<b>.....</b>
Less expense	38,150	.....
<b>Net income</b>	<b>\$936,176</b>	<b>.....</b>
<b>Fixed charges:</b>		
Interest on underlying securities	460,954	.....
*Interest on average amount of collateral trust bonds outstanding	42,850	.....
<b>Total fixed charges</b>	<b>\$503,804</b>	<b>.....</b>
†Remainder	432,372	.....
Dividend on average amount of preferred stock outstanding	203,640	.....
<b>Balance</b>	<b>\$228,732</b>	<b>.....</b>

\*Collateral trust bonds outstanding Sept. 30, 1912, \$839,000; outstanding June 30, 1913, \$893,000.

†Preferred stock outstanding Sept. 30, 1912, \$1,714,000; outstanding June 30, 1913, \$3,914,000.

The report says in part:

"The securities of the company outstanding at the present time are: Preferred stock, 6 per cent cumulative preferred (both as to dividends and assets), outstanding, \$3,914,000; authorized, \$20,000,000; common stock, outstanding, \$2,995,000; authorized, \$20,000,000; collateral trust 5 per cent thirty-year bonds, outstanding, \$893,000; authorized, \$2,000,000.

"Immediately upon the organization of the company, its subsidiaries were provided with funds with which to make any needed improvements or extensions.

"The entire street railway system in Jackson, Miss., has been overhauled and placed in first-class condition. Much new rail has been laid and a large amount of paving done between the tracks. The overhead system of the electric department and of the street railway has been improved and strengthened. The gas plant has been overhauled, new mains have been laid, and the entire distribution system has been placed in condition to make efficient service possible. All of the old equipment of the street car company has been abandoned and new cars purchased. The total expenditure for improvements, etc., is \$240,447.

"At La Crosse it has been necessary to rehabilitate the gas plant and authority was secured from the Railroad Commission of Wisconsin for the expenditure of approximately \$80,000. This work included the erection of a new machinery house, new purifiers, condensers, scrubbers, boilers, water-gas set and several miles of high-pressure main.



"At the Edison station of the La Crosse Company additional boilers are being installed to take care of the heating business of the company and the heating station equipment is being overhauled generally. The estimated cost of these improvements is \$35,000.

"Our business in Indianapolis has been growing very rapidly during the past year. The heating distribution system has been extended, as has also the electrical distribution system. The demand upon the two power houses of the Merchants' company has developed to such an extent that it has become necessary to install additional boilers. It has also been deemed advisable to install a water-softening plant. At the 'East plant' we are entirely rehabilitating the equipment. The expenditures for additional distribution capacity have been about \$20,000, and it is estimated that the other improvements which we have inaugurated will cost in the neighborhood of \$80,000.

"The plant of the People's Light & Heat Company, Indianapolis, is now being operated in connection with the plant of the Merchants' company and considerable saving in operating cost has been effected. The hot-water system of the People's company and the electrical distribution system are being improved and strengthened at an approximate expenditure of \$25,000."

The Public Utilities Commission of Indiana has approved the merging of the Merchants' Light & Heat Company and the People's Light & Heat Company, both of Indianapolis and both controlled by the American Public Utilities Company. The Merchants' company purchases the People's company for \$525,000. The bonds issued in payment have been sold to the Harris Trust & Savings Bank and Lee, Higginson & Company.

This merger was the result of the finding recently announced by the Public Utility Commission. Under this finding both companies were required to surrender their franchises, and the Merchants' company, as the merged corporation, was required to take out an indeterminate permit from the commission. The People's company surrendered its franchise some time ago, and the officials of the Merchants' Heat & Light Company recently surrendered the franchise of the company to the Public Utility Commission, as stipulated in the terms of the merger. At the same time a certificate of the increase in capital stock of the Merchants' company was filed with the Secretary of State, but because of technicalities the Secretary has not yet approved the papers. The increase is \$230,000 of common stock, making the total common stock of the company \$1,500,000. The preferred stock is \$1,500,000.

**Portland Railway, Light & Power Company**

The Portland Railway, Light & Power Company, Portland, Ore., in its earnings statement for the twelve months ended June 30, 1913, showed an increase in gross earnings of \$208,707, or 3.2 per cent, with an increase in net earnings of \$111,666, or 3.4 per cent. The complete statement follows:

	1913	1912
Gross earnings.....	\$6,683,215	\$6,474,508
Operating expenses (including taxes).....	3,310,139	3,213,098
Net earnings.....	\$3,373,076	\$3,261,410
Interest, etc.....	1,851,786	1,638,632
Surplus .....	\$1,521,290	\$1,622,778

The decrease of \$101,488, or 6.3 per cent, in the surplus was caused by an increase of \$213,154, or 13 per cent, in fixed charges for securities issued in connection with improvements and extensions, which have not yet begun to show results in gross and net earnings. The surplus, after charges, for the twelve months was equivalent to 6.1 per cent on the outstanding \$25,000,000 of capital stock, on which dividends of 1¼ per cent quarterly are being paid. Much of the new capital expenditure has been on the Mount Hood Railway.

**American Cities Company, New York, N. Y.**—The stockholders of the United Gas & Electric Company of Connecticut, New York, N. Y., have ratified the plan providing for the acquisition of the common stock of the American Cities Company in accordance with the plan referred to in the ELECTRIC RAILWAY JOURNAL of Aug. 30, 1913, page 353. It is proposed to create a new class of stock, second pre-

ferred, and to issue \$12,500,000 of this, increasing the corporation's capital from \$45,000,000 to \$57,500,000. The new stock is to bear interest at 2 per cent for 1914, the rate of interest being increased annually by 1 per cent until a rate of 6 per cent is reached, at which it will be continued. It is stated that the purchase of American Cities stock is to be made by the exchange of stock on a par basis, seventy-five shares of the new second preferred stock and twenty-five shares of the common stock of the United Gas & Electric Corporation being exchanged for each 100 shares of the common stock of the American Cities Company.

**Brantford (Ont.) Street Railway.**—In the suit of the city of Brantford against the Brantford Street Railway in which cancellation of the fifty-year franchise of the company and the recovery of \$27,000 in taxes were asked Justice R. M. Meredith of the High Court ruled in part as follows: "The company has one year in which to complete reconstruction of the line in those portions where it is defective and dangerous. The company is fined \$100 per month until such improvements are made. The company pays all costs of the High Court action. If the company does not comply within one year all rights, including the fifty-year franchise, are forfeited, and the company will pay the city \$1,200 damages in addition."

**Buffalo (N. Y.) Southern Railway.**—Justice Marcus in the Supreme Court of Erie County issued an order on Sept. 26 appointing Nathan Bundy receiver of the Buffalo Southern Railway, which operates from Buffalo to Hamburg and East Aurora. The bond was placed at \$20,000. The application was made by the Fidelity Trust Company, Buffalo, which is trustee of a mortgage for \$600,000 issued against the property of the company. The interest on the mortgage has been in default since 1909.

**Chicago (Ill.) Railways.**—Henry A. Blair has verified the report that the Chicago Railways management has more than a majority of proxies for the annual meeting. Regarding the negotiations with the city authorities for unified operation, Mr. Blair is reported to have said: "We have made some progress, harmonious feeling is evident and all are agreed to do anything we can toward improvement of the traction service."

**Chicago (Ill.) City Railway.**—L. A. Busby, president of the Chicago City Railway, and W. W. Gurley, representing the Chicago Railways, appeared before the sub-committee of the local transportation committee of the City Council of Chicago on Sept. 24 to express the attitude of their companies regarding the proposed subway plan. It was stated that while the surface lines were interested in the proposed system of subways, serious thought had not been given the matter recently because of the time expended in working out a unified operating agreement. It was stated that a report of the progress made toward accomplishing a merger of the two surface railway companies would be announced to the committee soon, after which a study would be made of the subway matter.

**Denver (Col.) City Tramway.**—More than two-thirds of the first collateral mortgage thirty-year 5 per cent gold bonds of the Denver & Northwestern Railway have been deposited for exchange under the terms of the offer of the Denver City Tramway. The exchange provides that for each \$1,000 face value of Denver & Northwestern Railway bonds there will be given \$1,000 first and refunding sinking fund mortgage twenty-five-year 5 per cent gold bonds of the Denver City Tramway, dated Nov. 1, 1908, due Nov. 1, 1933, and in addition thereto non-interest-bearing scrip of the face value of \$50 (issuable for bonds of the same issue in amounts of \$500 or multiples thereof), put out pursuant to the issue of the sinking fund mortgage.

**Fort Dodge, Des Moines & Southern Railroad, Boone, Ia.**—Judge Smith McPherson of the District Court of the United States for the Southern District of Iowa has directed George F. Henry, Des Moines, Ia., as special master to sell the property of the Fort Dodge, Des Moines & Southern Railroad under foreclosure not later than Nov. 29 for not less than \$2,676,000. The company was placed in the hands of Homer Loring and Parley Sheldon as receivers on June 6, 1910. Since then \$800,000 of receivers' certificates have been issued. There is a first mortgage under which \$3,000,000 of 5 per cent bonds are outstanding and a refunding mortgage under which \$2,800,000 of bonds are outstand-



ing. The trustees for the bondholders are respectively the Old Colony Trust Company, Boston, Mass., and the American Trust Company, Boston, Mass. The company was incorporated on Feb. 16, 1906, and acquired the Fort Dodge Street Railway, the Ames & College Railway and the Newton & Northwestern Railroad. The latter is a steam road extending from Newton to Rockwell City, Ia., and 37 miles between Fort Dodge Junction and Des Moines Junction were electrified, forming a part of the high-speed electric railway placed in operation in 1908 between Des Moines and Fort Dodge, with a branch to Ames.

**Galveston-Houston Electric Company, Galveston, Tex.**—The special meeting of the stockholders of the Galveston-Houston Electric Company called for Oct. 6 is to authorize an increase in the capitalization of the company from \$4,000,000 of common stock and \$3,000,000 of preferred stock to \$5,000,000 of common stock and \$4,000,000 of 6 per cent preferred stock. In reference to the increase, officers of the company state that in order to meet the demands of a constantly increasing business it will be necessary to make during the coming year various extensions and improvements to the street railway system in Galveston and Houston, as well as to the interurban line between the two cities. The more important items of construction are an increase of power facilities, purchase of new equipment, construction of carhouses and extensions of track. At least part of this money will be secured by the sale of stocks of the company and such portion of the new stock as required will be offered from time to time pro rata to stockholders of both common and preferred at par, and all stock not subscribed will be disposed of by the board as its judges may determine.

**Interborough Rapid Transit Company, New York, N. Y.**—T. De Witt Cuyler, Daniel G. Reid, E. R. Bacon and E. S. Marston have been elected directors of the Interborough Rapid Transit Company to fill the places made vacant by the retirement of G. L. Hoyt, John Pierce and G. W. Young, and to fill a previously existing vacancy.

**Scioto Valley Traction Company, Columbus, Ohio.**—At the annual meeting of the stockholders of the Scioto Valley Traction Company at Columbus on Sept. 23 Isaac B. Cameron, Columbus, and A. B. Voorhies, Cincinnati, retired from the board of directors and were succeeded by R. F. Warner, Columbus, and Harry M. Daugherty, the same city. The other members were all re-elected. The officers were re-elected.

**Second Avenue Railroad, New York, N. Y.**—The Second Avenue Railroad, which has been operated by receivers since the fall of 1908, has extended \$3,140,000 of 5 per cent receiver's certificates, which matured on Oct. 1, another year.

**United Railways & Electric Company, Baltimore, Md.**—The United Railways & Electric Company has notified the holders of three-year 5 per cent collateral trust convertible notes that the option of converting these notes into stock at \$25 a share will expire Jan. 2, 1914. They do not mature until July 1, 1914. There are about \$400,000 of these notes which remain unconverted.

#### Dividends Declared

Auburn & Syracuse Electric Railroad, Syracuse, N. Y., quarterly, 1½ per cent, preferred.

Boston (Mass.) Suburban Electric Companies, quarterly, 1 per cent, preferred.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 2 per cent, common.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅞ per cent, preferred; quarterly, 1½ per cent, common.

City Railway, Dayton, Ohio, 1½ per cent, preferred; quarterly, 2 per cent, common.

Columbia Railway, Gas & Electric Company, Columbia, S. C., quarterly, 1½ per cent, preferred.

Columbus, Newark & Zanesville Electric Railway, Cincinnati, Ohio, quarterly, 1½ per cent, preferred.

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii, quarterly, 2 per cent.

Illinois Traction System, Peoria, Ill., quarterly, 1½ per cent, preferred.

Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred.

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred.

Scioto Valley Traction Company, Columbus, Ohio, quarterly, 1¼ per cent, first preferred and preferred.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Virginia Railway & Power Company, Richmond, Va., 1½ per cent, common.

Western Ohio Railway, Lima, Ohio, quarterly, 1¾ per cent, first preferred; quarterly, 1½ per cent, second preferred.

West Indian Electric Company, Ltd., Kingston, Jamaica, quarterly, 1¼ per cent.

Winnipeg (Man.) Electric Railway, quarterly, 3 per cent.

#### ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.							
Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	July,	'13	\$208,751	*\$115,791	\$92,960	\$33,463	\$59,497
1 "	"	'12	192,754	*102,296	90,458	32,037	58,421
KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.							
1m.,	July,	'13	\$66,081	\$33,433	\$32,548	\$20,414	\$12,134
1 "	"	'12	65,773	39,687	26,086	16,144	9,942
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY.							
1m.,	Aug.,	'13	\$1,970,032	\$1,155,959	\$814,073	\$799,955	\$14,118
1 "	"	'12	1,913,094	1,145,964	767,130	757,101	10,029
2 "	"	'13	3,966,645	2,348,940	1,618,155	1,597,645	20,510
2 "	"	'12	3,832,035	2,302,192	1,929,843	1,515,283	14,560
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.							
1m.,	July,	'13	\$736,695	*\$416,737	\$319,959	\$172,609	\$147,350
1 "	"	'12	713,526	*415,078	298,448	163,105	135,243
12 "	"	'13	8,400,734	*4,903,129	3,497,605	2,035,398	1,462,207
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.							
1m.,	July,	'13	\$180,931	*\$101,097	\$79,834	\$24,166	\$55,668
1 "	"	'12	146,289	*76,927	69,363	20,858	48,505
12 "	"	'13	2,039,355	*1,090,251	949,104	286,461	662,643
12 "	"	'12	1,658,121	*899,655	758,467	241,454	507,012
PADUCAH LIGHT & TRACTION COMPANY, PADUCAH, KY.							
1m.,	July,	'13	\$23,988	*\$15,926	\$8,062	\$7,583	\$479
1 "	"	'12	22,875	*14,013	8,862	7,192	1,670
12 "	"	'13	288,317	*192,354	95,963	88,345	7,618
12 "	"	'12	277,349	*181,718	95,632	84,937	10,694
PENSACOLA (FLA.) ELECTRIC COMPANY							
1m.,	July,	'13	\$24,545	*\$15,643	\$8,902	\$6,767	\$2,135
1 "	"	'12	24,389	*14,692	9,697	6,377	3,320
12 "	"	'13	289,988	*181,533	104,455	77,142	27,313
12 "	"	'12	285,100	*179,288	105,812	71,038	34,774
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.							
1m.,	July,	'13	\$568,371	*\$284,374	\$283,997	\$171,378	\$112,619
1 "	"	'12	580,557	*281,655	298,902	141,015	157,887
12 "	"	'13	6,671,029	*3,312,858	3,358,171	1,882,149	1,476,022
12 "	"	'12	6,511,361	*3,235,816	3,275,545	1,648,986	1,626,559
PORTLAND (MAINE) RAILROAD							
1m.,	July,	'13	\$120,011	*\$58,952	\$61,059	\$18,025	\$43,034
1 "	"	'12	111,584	*59,055	52,529	16,746	35,783
12 "	"	'13	1,015,907	*711,138	304,769	262,282	178,487
12 "	"	'12	972,529	*694,060	278,469	124,025	154,443
ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY, ST. JOSEPH, MO.							
1m.,	July,	'13	\$105,701	*\$60,451	\$45,250	\$20,067	\$25,183
1 "	"	'12	98,335	*58,164	40,171	19,582	20,589
12 "	"	'13	1,223,982	*688,445	535,537	239,195	296,341
12 "	"	'12	1,142,078	*684,581	457,497	234,483	223,014
SAVANNAH (GA.) ELECTRIC COMPANY							
1m.,	July,	'13	\$71,126	*\$46,007	\$25,119	\$22,755	\$2,364
1 "	"	'12	61,406	*44,894	16,513	16,313	200
12 "	"	'13	796,749	*559,993	236,756	230,992	5,764
12 "	"	'12	726,793	*536,727	190,066	189,030	1,036
TAMPA (FLA.) ELECTRIC COMPANY							
1m.,	July,	'13	\$71,407	*\$39,877	\$31,529	\$4,531	\$26,998
1 "	"	'12	63,181	*32,340	30,841	4,365	26,476
12 "	"	'13	787,660	*420,927	366,733	55,307	311,426
12 "	"	'12	732,567	*389,833	342,735	54,541	288,194
UNION RAILWAY, GAS & ELECTRIC COMPANY, ROCKFORD, ILL.							
1m.,	July,	'13	\$362,267	*\$197,557	\$164,710	\$97,925	\$66,775
1 "	"	'12	330,434	*196,549	133,885	90,914	42,971
12 "	"	'13	4,577,407	*2,564,971	2,012,436	864,483	315,000
12 "	"	'12	3,508,476	*2,039,244	1,469,232	817,934	651,298
VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.							
1m.,	July,	'13	\$447,477	\$217,922	\$229,555	\$132,651	\$96,904
1 "	"	'12	415,728	211,715	204,012	122,988	81,024

\*Includes taxes.



# Traffic and Transportation

## Accident Talks in Jackson

When the property of the Jackson Light & Traction Company, Jackson, Miss., was taken over by the American Public Utilities Company more than a year ago the situation in regard to accidents was quite serious and the company was troubled considerably by frivolous complaints. The officers decided upon an accident prevention campaign and under the direction of Raymond H. Smith, general manager, a series of accident talks is being printed and hung in the cars from time to time in packages of twenty-five each so that they can be easily torn down and read by passengers. The accident talks have aroused a great deal of interest and favorable comment and have had a direct bearing in reducing accidents. The first of these talks, together with talks No. 3 and No. 4, entitled respectively "To Drivers of Automobiles and Other Vehicles" and "Damage Suits and Public Opinion," follow:

### "Help Us Avoid Accidents

"For humanitarian reasons, as well as for the reason of expense, we are making every effort to avoid accidents. To be successful we must have your assistance, and this can best be given by using great care to avoid injury to yourself. Don't take chances.

### "Wait Until the Car Stops

"Boarding or alighting from a moving car is dangerous. The car will come to a complete stop for you and even though you feel competent to board or alight while the car is in motion, remember that there is a possibility of your slipping and being injured. Wait.

### "Always Face Front of Car

"In boarding or alighting face in the direction the car is going. Don't form the habit of facing the rear in getting off a car. If you should forget yourself and alight when car is in motion you are sure to be injured if you are facing the rear of the car.

### "Passing in Front of Cars

"In crossing streets don't pass directly in front of approaching cars. You may trip and fall. The few seconds you gain by walking in front of a car are unimportant. Pass behind the car—there's more room.

### "Look Before Stepping on Track

"Don't step from behind a car onto the other track without looking to see if there is a car approaching. Numerous accidents are caused by the failure to take this simple precaution. Begin now.

### "Please Give Your Name

"In case of an accident we must know the facts. These can be obtained only from the witnesses. If the company is not at fault we wish to know it for protection against unjust claims, and, on the other hand, if we are at fault we are equally anxious to have the facts in order that we may deal fairly in all matters connected with the accident. If you are a witness to an accident, whether you are a passenger or not, we ask that you give us your name for the good of all concerned.

### "Co-operation

"The co-operation we desire from you is not the kind that will do our work for us, nor do we desire to shift responsibility. We ask merely for the appreciation and encouragement accorded any worthy enterprise whose labor and ambitions help to make the city bigger, better and brighter.

"Let's pull together in this matter of accident reduction, which is of equal importance to us both. Begin now by taking this pamphlet home and asking the other members of your family to read it and

### "Wait Until the Car Stops."

### "To Drivers of Automobiles and Other Vehicles

"Trolley cars have but one course to follow in the street, that is, along the tracks, while in most cases there is sufficient room for vehicles to be driven elsewhere. It is obvious that the surest way to avoid injury to yourself and property is to keep off the track as far as it is practicable to do so. There are in particular two classes of accidents which can be entirely eliminated with your co-operation. We refer to accidents caused by driving rapidly out of side streets onto the tracks and by people who are driving

alongside the tracks suddenly pulling their vehicles onto the track in front of moving cars.

"We ask that you co-operate in the reduction of accidents by starting right now and making it a rule to drive out of side streets onto streets with car tracks at such a slow rate of speed that you can easily stop before reaching track, if a car is approaching. Upon reading this you may think 'Let the motorman look out for me. Why should I look out for him?' Our answer to this is that we are both working with a common end in view—to avoid accidents. If you will co-operate in this by looking out for your own safety, your precaution, together with the care we are asking our employees to exercise will eliminate accidents, suffering and expense.

"So we say, before driving out of side streets onto the car tracks reduce your speed and look out for approaching cars. If a car is coming, don't take a chance and try to pass in front of it, assuming that the motorman can stop. We tell our motormen not to assume and request that you take the same precaution. It takes but a few seconds to slow down and await for a car to pass. Don't assume that a motorman can stop his car in time to avoid hitting you—perhaps he can't. Wait.

"In driving alongside of car tracks, keep as far away as possible, so that a slight movement of your vehicle will not bring it close enough to track to be hit by a passing car. Always look around before driving onto track and see that no car is approaching from the rear. If one is coming, just hold back that temptation to take a chance—wait for it to go by.

"In asking you to do these things we are not remaining idle ourselves. We are each day striving in various ways to reduce accidents and are trying to see just how long we can go without a mishap. We ask your help in this.

### "REMEMBER

"Keep off the tracks as much as possible. Don't assume it to be safe to drive in front of an approaching car, but instead get the habit of passing back of it."

### "Damage Suits and Public Opinion

"Accidents and resultant damage suits have a direct bearing upon the quality of service a railway can give and the amount of capital it can put into improvements. Right here is where you are interested.

"Many frivolous accident claims have at various times been filed against this company, some of them recently. In one case the company is being sued for several thousand dollars by a lawyer who has yet to learn that this case was settled by his client for a few dollars some time ago. We venture to say that to this day the plaintiff in this case does not even know that a suit has been filed in his behalf. This gives but a slight idea of conditions as they exist.

"The policy of this company is to be absolutely fair in all its dealings, but it also proposes to fight to the end every frivolous and unjust accident claim—just as you would do in your own private business. It is a mistake to think that every accident should be followed by a notice of suit. A calm, frank discussion of the facts of the case would be much more beneficial to all concerned.

"If this company is to be subjected to the expense of defending itself against unjust claims, occasionally being mulcted in damages, it is going to be just so much more difficult to give proper service and make general improvements to the property.

"It is the desire of the company to give the people of Jackson a street railway system of which they will feel proud. We want to do our share toward reaching that 50,000 mark in 1915. But in order to make this possible we must have your assistance in reducing accidents and unjust claims for damages. You can help in the reduction of accidents by using great care to avoid injury to yourself. You can assist in the reduction of frivolous and unfair claims and verdicts by giving us your name, when a witness to an accident, and by doing your share to create a public sentiment against these things. Public opinion is not an intangible, mysterious thing. It is the influence of your own sentiment, your partners, your neighbors, and others of the community. If as individuals you will assist by creating a public sentiment for fairness in these matters, you will play an important part in improving the street railway facilities of this city.



### "COME IN

"The office of the management is open to all—no red tape, no closed doors, no waiting. Nothing like sitting down and talking a thing over. We've always got the time. Try it!"

The accident talks are printed on colored paper 6 in. wide by 9 in. high, and the color of the paper of the next talk is announced at the bottom of each talk as it is placed in the cars for distribution.

### Report of California Commission on Los Angeles Accident

The Railroad Commission of California has made public the result of its inquiry into the collision on July 13, 1913, between a three-car electric train operated by the Pacific Electric Railway, Los Angeles, on its so-called "Short Line" between Los Angeles and Venice, and a standing three-car electric train operated by the same company, near a station called Vineyard. As a result of this collision sixteen people died and many were seriously injured. The commission concludes its opinion in part as follows:

"It would appear that the three principal actors in the matter of this collision, to wit, Motorman Clarke, Flagman Bartholomai and Motorman Forster, each contributed to the cause of this collision, either by a violation of the rules of operation or by a failure to apply such rules intelligently."

In its order the commission directs the company in part as follows:

"It is hereby ordered that the Pacific Electric Railway submit for the approval of this commission within sixty days from the date of this order the following:

"A comprehensive and complete plan for the instructing, training, examining and testing of its employees, and within a like period submit for the approval a complete and comprehensive diagram and plan of an automatic block signal and staff signal system, covering its entire system outside of city limits, including the location, type and estimates of cost of such signaling system.

"A complete statement showing the location of all crossings of its tracks by roads or highways; whether such crossings are at grades or are separated; what, if any, protection or warning is provided at such crossings.

"A complete statement showing the location of crossings of main line tracks by other main line tracks, the protection against collisions which now exists at such crossings, together with estimates of the cost of installing at all such crossings adequate interlocking plants in compliance with this commission's General Order No. 33; provided further, that this proceeding will remain open for the rendering of further orders in the premises.

"The foregoing opinion and order are hereby approved and ordered filed as the opinion and order of the Railroad Commission of the State of California."

The case was decided by the commission on Aug. 15.

### Chicago Convention Special Train

Indications at the present time are that approximately 150 electric railway and supply men will be aboard the convention special train which leaves Chicago via the Pennsylvania Railroad, Oct. 12, at 10.30 a. m. Up to Sept. 30 a total of 120 reservations have been made on this special train, which now includes twelve coaches. At a luncheon on Sept. 29 the Chicago supply men organized an entertainment committee to act on the special train. Several special committees were appointed to provide entertainment for the railway representatives and the ladies accompanying them.

**St. Louis Conductor Arrested for Stealing.**—A conductor in the employ of the United Railways, St. Louis, Mo., has been arrested for stealing fares. The practice of the conductor was to extract nickels from the fare box with the aid of part of a small clock spring.

**Council Approves London & Port Stanley Electrification.**—The City Council of London, Ont., has passed a by-law approving the electrification of the London & Port Stanley Railway. A by-law to this effect will now be submitted to the ratepayers of London for ratification.

**Fare Hearing in Schenectady Continued.**—The three days'

hearings on the application of certain residents of Schenectady to the Public Service Commission of the Second District of New York for a rate of six rides for 25 cents over the lines of the Schenectady Railway ended on Sept. 24 in a postponement until Oct. 20. In the meantime Frank E. Belleville, auditor of the company, is to prepare a statement showing in detail its gross and net receipts for the years from 1898 to 1912.

**Smoking Question Up Again in Kansas City.**—So much public sentiment in regard to smoking prevails in Kansas City that an effort probably will be made to reinstate the cigars on the back platforms. Smoking was abolished by the Metropolitan Street Railway about a year ago, the City Council co-operating by passing an ordinance prohibiting it. Smokers contend that no annoyance attaches to smoking on the rear platform. No concerted action has as yet been taken, but it is said that tobacco dealers and others are awaiting only a settlement of the franchise questions now affecting the company before pleading the question.

**Smoking Prohibited in Brooklyn.**—J. F. Calderwood, vice-president of the Brooklyn (N. Y.) Rapid Transit Company, notified the Public Service Commission of the First District of New York recently that the companies in the Brooklyn Rapid Transit system would accept, without contest, the order of the commission prohibiting, after Oct. 1, smoking on street railroad cars, in stations, on station platforms, stairways and in station waiting rooms. The only exception to this order is that open cars having running boards along the sides and having seats directly accessible from such running boards may have four seats at one end for smokers. The order of the commission was published in the *ELECTRIC RAILWAY JOURNAL* of Aug. 23, 1913, page 318.

**Conference in Regard to Transfer Modifications in Brooklyn.**—After a conference on Sept. 25 between T. S. Williams, president of the Brooklyn (N. Y.) Rapid Transit Company, and Chairman McCall and Commissioner Williams, of the New York Public Service Commission for the First District, a public hearing on transfers between the elevated system and surface lines of the Brooklyn Rapid Transit Company for the purpose of reorganizing the transfer system was held. Frank Bennett, supervising inspector of the commission, and C. D. Meneely, vice-president and treasurer of the Brooklyn Rapid Transit Company, were appointed a committee to arrange a new system of transfers more extensive than that at present in operation. It is understood that the new arrangement will provide for the exchange of transfers between the lines of the Brooklyn Rapid Transit Company and the Coney Island & Brooklyn Railroad.

**Prizes Awarded in Baseball League.**—The Interborough Baseball League, composed of employees of the Interborough Rapid Transit Company, New York, closed a successful season recently by a dinner at Brighton Beach, with 250 members of the eight teams in the league and invited guests in attendance. Theodore P. Shonts, president of the Interborough Rapid Transit Company, presided, and the guests included Major-General Barry, U. S. A.; Captain Woodward, U. S. A.; Frederick Underwood, president of the Erie Railroad; W. G. Besler, vice-president of the Jersey Central Railroad; A. R. Whaley, vice-president of the New York, New Haven & Hartford Railroad; John E. Eustis, Public Service Commission; Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company; H. H. Vreeland, F. A. Megeath, president of the Galena-Signal Oil Company; Daniel M. Brady, Samuel Curwen, president of The J. G. Brill Company, Philadelphia, and B. A. Hegeman, president of the U. S. Metal & Manufacturing Company. Mr. Shonts presented each member of the Subway Giants, the winning team, with a gold medal, while the champion pennant went to the transportation department, which the Subway Giants represented. Speeches were made by Mr. Shonts, General Barry, John Whalen and Frederick Underwood. The league was composed of eight teams, representing the different departments of the Interborough system. Twenty-one games were scheduled for each team. The Subway Giants won eighteen games and lost two. The car equipment department finished second, with fifteen victories and four defeats, and the lighting department third, with sixteen games won and five lost.



## Personal Mention

**Mr. F. F. Nasmith**, auditor of the Kentucky Public Service Company at Hopkinsville, Ky., has been transferred to Jacksonville, Fla., by the J. G. White Management Corporation, which operates the properties, and is to be succeeded at Hopkinsville by Mr. H. R. Gore, assistant auditor of the Washington Railway, Light & Power Company, Washington, D. C.

**Mr. Harrison R. Fehr**, president and general manager of the Easton (Pa.) Transit Company, has been elected president of the Lehigh Valley Transit Company, Allentown, Pa., to succeed Mr. R. P. Stevens, who, as previously announced in the *ELECTRIC RAILWAY JOURNAL*, has been elected president of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, and its subsidiaries.

**Mr. R. P. Stevens**, the retiring president of the Lehigh Valley Transit Company, Allentown, Pa., had a farewell dinner tendered to him on Sept. 20 at the Hotel Allen by the newspaper men of Allentown and Bethlehem. Mr. George Zimmerman, editor of the *Chronicle and News*, as the chairman of the committee of arrangements, introduced Mr. George R. Roth, of the *Leader*, as toastmaster. Among the speakers was Mr. E. C. Spring, of the Philadelphia & Western system, who paid high tribute to Mr. Stevens. Mr. Carson W. Masters followed Mr. Spring. He reviewed the progress of the street railway system of Allentown since 1888. He declared the leaving of Mr. Stevens to be a direct loss to the community. Mr. P. F. Enright, South Bethlehem, also spoke in eulogistic terms of Mr. Stevens. Mr. Stevens was the last speaker. He said that he hoped to return to Allentown some day to live.

**Mr. Henry Howland Crapo**, who has been elected president of the Massachusetts Street Railway Association, was born in New Bedford, Mass., on Jan. 31, 1862, the son of Mr. William W. Crapo and Mrs. Sarah Tappan Crapo. He prepared for college at the Friends' Academy in New Bedford and was admitted to Harvard in June, 1879. After he was graduated in 1883 he entered the Harvard Law School and remained there two years. He was admitted to the bar in Bristol County, Mass., in June, 1886, and became a member of the law firm of Crapo, Clifford & Clifford, now Crapo, Clifford & Prescott, with which he is still connected. Mr. Crapo served as an alderman of New Bedford in 1893 and as associate justice of the Third District Court of Bristol 1895-1898, and he has been president of the Mechanics' National Bank of New Bedford since 1906. He was elected president of the Union Street Railway, New Bedford, in 1894 and a few years later was elected president of the Dartmouth & Westport Street Railway, which was subsequently consolidated with the Union Street Railway. In 1901 the New Bedford & Onset Street Railway was organized and Mr. Crapo was elected president of the company, which office he now holds. Subsequently the Middleboro, Wareham & Buzzards Bay Street Railway was consolidated with the New Bedford & Onset Street Railway.

### OBITUARY

**Francis V. T. Lee**, formerly assistant to the president of the Pacific Gas & Electric Company, San Francisco, Cal., is dead. Mr. Lee was born at Winchester, Eng., on Aug. 28, 1870. He was educated at the Manchester Grammar School and in France and was graduated with the degree of B.A. in electrical engineering from the Leland Stanford, Jr., University, in California, in 1897. He was assistant to Dr. F. A. C. Perrine, professor of electrical engineering, from 1893 to 1897 and was connected with the Stanley Electric Manufacturing Company on the Pacific Coast for several years. In 1900 he was elected vice-president and general manager of John Martin & Company, San Francisco, and also district Pacific Coast manager for the Stanley Electric Manufacturing Company and other Eastern manufacturers. Early in 1906 he severed his connection with John Martin & Company, became interested with Mr. Martin in the Pacific Coast Gas & Electric Company and was made assistant to the president of that company. He retired from active business about three years ago. He is survived by a widow and two daughters.

## Construction News

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

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

### RECENT INCORPORATIONS

**Tipton, Windfall & Marion Traction Company, Windfall, Ind.**—Incorporated in Indiana to build an electric railway between Tipton, Windfall and Marion. Capital stock, \$10,000. Incorporators: W. R. Bailey, C. S. Cleaver and J. F. Fulton.

**Tri-State Railways, Toledo, Ohio.**—Application for a charter has been made by this company in Ohio to build an electric line from Pioncer, Ohio, to Hillside, Mich. It will connect with the Toledo & Western Railroad at Pioncer. Capital stock, \$100,000. Incorporators: H. McClue, Charles H. Heller and Miles T. Davis, Hillsdale, and William E. Elliott, Chicago. [E. R. J., Sept. 27, '13.]

**\*Dakota Eastern Railroad, Pierre, S. D.**—Application for a charter has been made by this company in South Dakota to build a 48-mile interurban railway between Clear Lake and Watertown. Capital stock, \$800,000. Incorporators: William Eglend, Harry D. Barrett, Edwin Merhagen, St. Paul; Harry F. Harp and Almon E. Chilson, Webster.

### FRANCHISES

**Argenta, Ark.**—The Argenta Railway has received a three-year extension of time on its franchise to begin the construction of its line in Argenta to the Factoria Land Company.

**Los Angeles, Cal.**—The Pacific Electric Railway has received a franchise to build its main-line track at grade across a private right-of-way near Santa Ana and at the grade across Main Street in Los Angeles.

**San Diego, Cal.**—The Los Angeles & San Diego Beach Railway, San Diego, will ask the Council for a renewal of its franchises over its present line to La Jolla from Arctic Street and the present city lines to the Cuyamaca railway station at the foot of Twelfth Street in San Diego.

**Sausalito, Cal.**—W. W. Hicks, representing the San Rafael & San Anselmo Valley Railway, has asked the Board of Supervisors for a franchise over the county roads between Sausalito and San Rafael. He has also asked the Council for a franchise in Sausalito. This is part of a plan to build a 6-mile line between San Rafael and San Anselmo. [E. R. J., Sept. 20, '13.]

**Galesburg, Ill.**—The Peoria, Canton & Galesburg Railway, Peoria, has received a thirty-five-year franchise from the Council in Galesburg. The company will soon ask for a franchise from the Councils in Maquon and in Knoxville. This 52-mile line will connect Peoria, Canton and Galesburg. Horace Clark, Peoria, president. [E. R. J., Sept. 20, '13.]

**Baltimore, Md.**—The United Railways & Electric Company has been authorized by the City Council to lay a single track on the new part of Aisquith Street, between Baltimore Street and Fayette Street, in Baltimore.

**Hasbrouck Heights, N. J.**—A. L. Whipple of this place, and for a long time prominently connected with the railway supply business, has applied for a franchise for a trackless trolley system for a line about 2 miles in length. Mr. Whipple is interested in real estate in this place.

**Wilkes-Barre, Pa.**—The Hanover & Southern Railway has received a fifty-year franchise from the Council over Academy Street, Old River Road and other thoroughfares in Wilkes-Barre.

**Jackson, Tenn.**—The City Council has decided to take final action on a new franchise of the Jackson Railway & Light Company at a meeting to be held Oct. 7. A fifty-year franchise has been asked for, and the company has agreed in case it is granted to build a line to the West Tennessee Experiment Station and other important suburban points.

**Nashville, Tenn.**—The Nashville Traction Company has asked the Council for a franchise in Nashville. It is to be submitted to the voters. This company plans to build 34



miles of track in Nashville. Walter O. Parmer, Nashville, is interested. [E. R. J., Aug. 2, '13.]

**Dallas, Tex.**—The Dallas Consolidated Electric Railway has asked the Council for a franchise to build fourteen switch tracks and one cross-track from its line on Peak Street into the site for its new repair shops on Elm Street in Dallas.

**Clark, W. Va.**—The Elkhorn Valley Traction Company, Clark, has received a franchise through the corporate limits of Clark and Keystone, a distance of about 5 miles. L. E. Tierney, Powhatan, president. [E. R. J., Sept. 6, '13.]

#### TRACK AND ROADWAY

**Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala.**—This company has placed in operation its 3-mile line from Gadsden to Noccalula Falls. It is planned to build an extension soon.

**Little Rock Railway & Electric Company, Little Rock, Ark.**—This company has awarded a contract to Woodsmall, McCarthy & Peay to subgrade the Neimeyer extension of its Highland Park line for a distance of about 2 miles in Little Rock.

**Phoenix (Ariz.) Street Railway.**—This company is asked to consider plans to double-track its First Street line between Adams Street and Roosevelt Street in Phoenix. The improvements planned by this company for early installation include the double-tracking of the Indian School line and a new track from the First Street to the Second Street lines along Monroe Street in Phoenix.

**British Columbia Electric Railway, Vancouver, B. C.**—This company has opened its new 23-mile line from Victoria to Deep Cove and a new 20-mile line from Duncan to Cowichan Lake.

**Northern Electric Railway, Chico, Cal.**—This company is asked to extend its C Street line to Thirty-first Street in Sacramento.

**San José (Cal.) Railways.**—The Railroad Commission has rendered a decision directing this company to reconstruct within the next six months the narrow-gage portion of its San José and Alum Rock railway as a standard-gage railway. The section to be converted extends from the present terminus of the company's standard-gage railway at Twenty-sixth Street, San José, to Linda Vista station, a distance of  $3\frac{1}{4}$  miles.

**Mount Carmel Railway, Hamden, Conn.**—Plans are being made by this company to build an electric line from the terminal of the Connecticut Company's line to the top of Mount Carmel. The charter for this proposed line was granted in 1911. Capital stock, \$75,000. Directors: Willis M. Cooke, C. F. Clarke and Sereno P. Cooke.

**Georgia Railway & Power Company, Atlanta, Ga.**—This company has completed its line from Atlanta to Stone Mountain.

**Columbus (Ga.) Electric Company.**—The City Council proposes to make arrangements with this company to extend its lines in Girard.

**Chicago & Joliet Electric Railway, Joliet, Ill.**—Work has been begun by this company laying new tracks on State Street in Lockport.

**Springfield & Northwestern Railway, Springfield, Ill.**—This company has been selling stock, securing right-of-way and by the sale of lots on a tract of land near the Sangamon River is endeavoring to put assets back of the proposition to build its line to connect Springfield, Cantrell, Casey, Athens, Petersburg, Greenview and Mason City. Ralph N. Baker, president. [E. R. J., Aug. 3, '12.]

**Aurora, Elgin & Chicago Railroad, Wheaton, Ill.**—Work will be begun at once by this company repairing all of its lines in Aurora.

**Union Traction Company of Indiana, Anderson, Ind.**—Plans are being considered by this company to build an extension between Alexandria and Muncie.

**Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.**—Work will soon be begun by this company laying new rails on Wallace Street in Fort Wayne.

**Louisville & Southern Indiana Traction Company, New Albany, Ind.**—This company has decided to remove its

tracks from Market Street between Fourth and Thirtieth Streets in New Albany, and will operate its Silver Hill line on Thirteenth and Spring Streets instead.

**Independence, Neodesha & Topeka Traction Company, Independence, Kan.**—It is reported that construction will be begun by this company at once on its 17-mile line to connect Independence, Neodesha, Altoona, Fredonia and Topeka. William N. Ness, Independence, general manager. [E. R. J., Aug. 2, '13.]

**South Covington & Cincinnati Street Railway, Covington, Ky.**—The United States District Court at Covington, Ky., has issued a temporary restraining order to prevent the city of Covington from accepting bids under an ordinance for the sale of an electric railway franchise over certain streets in Covington. The petition for an injunction was filed by the South Covington & Cincinnati Street Railway. The petitioner claims that the sale of a franchise is in violation of its property rights.

**New Orleans Railway & Light Company, New Orleans, La.**—It is reported that this company plans to build an extension along the shore of Lake Pontchartrain to Spanish Fort, Milneburg and People's Avenue in New Orleans.

**Detroit (Mich.) United Railway.**—A resolution has been introduced in the City Council requiring this company to lay a double track on Trumbull Avenue from Michigan Avenue south to Fort Street and ordering Trumbull cars to be routed to Detroit via Fort Street, looping around Cadillac Square and returning by the same route.

**St. Paul Southern Electric Railway, St. Paul, Minn.**—Plans are being considered by this company for an 8-mile extension from Rochester, Minn., to Decorah, Ia. Work on the line between St. Paul and Hastings is progressing rapidly.

**Hannibal Railway & Electric Company, Hannibal, Mo.**—Plans are being considered by this company to extend its line in Hannibal out Broadway from Hueston Street, to connect with the St. Mary's line at old Smith's Park. Application for a franchise will soon be made to build this branch.

**St. Joseph Railway, Light & Power Company, St. Joseph, Mo.**—Plans are being considered by this company to build a line between St. Joseph and Atchison via Beanville.

**Binghamton (N. Y.) Railway.**—New rails are being laid by this company on its State Street line between Henry Street and Eldridge Street in Binghamton.

**Brooklyn (N. Y.) Rapid Transit Company.**—Work on this company's elevated extension from the city line of Brooklyn along Liberty Avenue and Lefferts Avenue to Morris Park and Jamaica will be begun some time in November, according to a report. It is said the company has secured all the consents of property owners along the line of the proposed extension. It is intended to submit construction contracts to the Public Service Commission at an early date, and as soon as they are approved contracts will be let for the construction work.

**New York State Railways, Rochester, N. Y.**—This company has purchased property in West Avenue in Rochester, just west of Lincoln Park, on which a loop will be built.

**Schenectady (N. Y.) Railway.**—Among the improvements planned by this company will be block signals on three interurban divisions of its lines.

**Newbern-Ghent Street Railway, Newbern, N. C.**—Plans are being considered by this company for an extension in Newbern.

**Lake Erie & Northern Railway, Brantford, Ont.**—About 4 miles of rails have been laid by this company from Galt, and the grading has been completed from Galt to a point 2 miles south of Glenmorris.

**Nipissing Central Railway, North Cobalt, Ont.**—The Chamber of Commerce has passed a resolution in favor of the extension of this company's line to Fort Temiskaming and Ville Marie.

**Dunnville, Wellandport & Beamsville Electric Railway, Wellandport, Ont.**—This company is about to resume construction, arrangements having been completed for the sale of extra bonds. About 13 miles are graded and ties laid on this part of the line, the bridges and structural work being also completed on this division. The line has a



charter from Port Dover to St. Catharines, with branches to Dunnville, Welland, Jordan Harbor and other points, making train connections with the Grand Trunk Railway, the Wabash Railroad, the Michigan Central Railroad and the Toronto, Hamilton & Buffalo Railway. [E. R. J., Sept. 6, '13.]

**\*Phoenixville, Pa.**—Plans are being considered to build an electric railway from Williams Corner, 1 mile south of Phoenixville, taking the White Horse Road to Cedar Hollow, thence to Valley Stores and then on to Malvern and West Chester. Among those interested are Charles B. Highley, A. A. Catanach, Devault, and Herbert T. Taylor, White Horse Road.

**Rhode Island Company, Providence, R. I.**—Among the improvements being considered by this company are the extension of the John Street line to Prospect Hill and the laying of new rails between Prospect Hill and Saylesville. The company has awarded a contract to Joseph McCabe to build the extension of its Smith Street line in Providence to Chepachet.

**Nashville Railway & Light Company, Nashville, Tenn.**—Work will soon be begun by this company for the 1-mile extension of its First Street line in Nashville to Trinity, La. Surveys have been completed.

**Bryan & Central Texas Interurban Railroad, Bryan, Tex.**—A 20-mile extension is being built by this company to Wilcox.

**Dallas Southwestern Traction Company, Dallas, Tex.**—Chartered in Texas to build an interurban railway between Dallas and Glen Rose, with a branch from Eagle Ford to Irving. Headquarters, Dallas. Capital stock, \$500,000. Incorporators: E. P. Turner, Cullen F. Thomas, S. P. Cochran, E. Strickland, S. P. Morgan and B. M. Sansom. [E. R. J., Sept. 20, '13.]

**Texas Traction Company, Dallas, Tex.**—Rails have been received and work will soon be begun by this company on its extension on South Willow Street from Lamar Street to St. Vincent's Sanitarium in Sherman.

**Galveston-Houston Electric Railway, Houston, Tex.**—Plans are being made by this company for extensions and improvements of its lines in Houston.

**Salt Lake & Utah Railroad, Salt Lake City, Utah.**—This company states that about 7 miles of track have been laid on its line in Salt Lake, Lehi, American Fork and Provo, and an overhead crossing over the steam railroad tracks at Salt Lake City will be completed within the next few weeks. Material is at hand in the yards at Salt Lake City. It is expected to complete the railway to Provo by the first of the year and the line from Provo to Payson during the coming year. All grading will be completed during October. Catenary construction will be used.

**Utah Light & Railway Company, Salt Lake City, Utah.**—Tracklaying on this company's line from Warm Springs to Centerville, a distance of 13 miles, has been completed. It will not be placed in operation until a power station can be built at Bountiful.

**Virginia Railway & Power Company, Richmond, Va.**—Work on the 1-mile Broad Street extension of this company's line in Richmond will be begun as soon as the material is obtained.

**Kittitas Railway & Power Company, Cle Elum, Wash.**—This company states that it plans to begin construction in the spring on its 38-mile line between Roslyn and Cle Elum, via Ronald and Janesville. Paul L. Richards, Tacoma, president. [E. R. J., Dec. 21, '12.]

**Kelso & Eastern Railroad, Kelso, Wash.**—This company states that surveys have been made but it is uncertain when construction will be begun on its line from Kelso eastward toward Mayfield. Capital stock authorized, \$200,000. Officers: J. L. Harris, Kelso, president and general manager; John M. Ayres, Kelso, vice-president; F. L. Stewart, Kelso, secretary, and G. L. Buland, Castle Rock, treasurer. [E. R. J., July 26, '13.]

**Puget Sound Traction, Light & Power Company, Seattle, Wash.**—This company is asked to consider plans to extend its lines from Seattle Boulevard to Holgate Street on Fourth Avenue South in Seattle.

**Elkhorn Valley Traction Company, Clark, W. Va.**—Grading has been begun by this company on its line between Clark and Keystone. The following officers have been elected: L. E. Tierney, Powhatan, president; W. E. Stewart, Keystone, vice-president; L. H. Clark, Kyle, treasurer; C. C. Hale, Keystone, secretary, and A. Catzen, Northfolk, general manager. Headquarters: Clark. [E. R. J., Sept. 6, '13.]

#### SHOPS AND BUILDINGS

**British Columbia Electric Railway, Vancouver, B. C.**—This company is considering plans to build double-deck carhouses adjacent to its present carhouse at the corner of Thirteenth Avenue and Main Street in Vancouver. Plans and specifications have been submitted to the Board of Public Works. The cost of the buildings is estimated to be about \$300,000.

**Gainesville Railway & Power Company, Gainesville, Ga.**—This company has completed its new office building on Main Street in Gainesville.

**Kalamazoo-Grand Rapids Electric Railway, Kalamazoo, Mich.**—It is reported that this company will purchase the Nelson Matter tract in Grand Rapids for a site for a new terminal station, which will cost \$400,000.

**Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo.**—This company has been asked to consider plans to build three new passenger stations between Ashton and Ritchey.

**Schenectady (N. Y.) Railway.**—Within the next few years this company plans to build a new storage house in Schenectady.

**Cleveland (Ohio) Railway.**—A new group of repair shops and buildings are to be erected this winter by this company at Harvard Avenue and East Forty-ninth Street in Cleveland, at an estimated cost of \$600,000. The shops at Euclid Avenue and East Twenty-third Street will be abandoned. The new buildings will be able to care for 3000 cars, or 1800 more than are now in service.

**Toronto (Ont.) Railway.**—This company plans to build new carhouses on Bracondale Avenue near Benson Avenue in Toronto. The structure will be one-story and of steel, brick and concrete construction. The cost is estimated to be about \$14,000.

**Eastern Texas Traction Company, Dallas, Tex.**—This company has opened headquarters in Greenville and will occupy an entire floor in one of the largest buildings.

#### POWER HOUSES AND SUBSTATIONS

**Havana (Cuba) Central Railroad.**—During the next few months this company will award contracts to build new substations at Rincon, Guiva de Melena and Artemisa.

**Albany (Ga.) Rapid Transit Company.**—This company is installing in its plant on Front Street in Albany entirely new equipment, including a 350-hp generator.

**Georgia Railway & Power Company, Atlanta, Ga.**—This company has completed its new substation in Atlanta.

**Schenectady (N. Y.) Railway.**—Among the improvements planned by this company within the next three years will be a new substation in Schenectady.

**Philadelphia (Pa.) Rapid Transit Company.**—Under a new contract this company expects to get from the Philadelphia Electric Company an additional supply of motive power for some of its lines early in October.

**Montreal (Que.) Tramways.**—This company has ordered from the Canadian General Electric Company two 1000-kw motor-generator sets. One set is to be installed in the Côte des Neiges station of the Montreal Public Service Corporation and the other in the St. Henry substation of the Montreal Tramways.

**Southern Traction Company, Dallas, Tex.**—This company has begun the installation of equipment in its power plant at Trinity Heights, near Dallas. The station will be used to operate the company's interurban lines that extend to Waco and Corsicana.

**Utah Light & Railway Company, Salt Lake City, Utah.**—This company has awarded a contract to E. I. Anderson, Salt Lake City, to build its new substation at Bountiful. The cost is estimated to be about \$12,000.



# Manufactures and Supplies

## ROLLING STOCK

**Grand Rapids, Holland & Chicago Railway, Holland, Mich.**, has ordered six 61-ft. all-steel interurban coaches from the St. Louis Car Company.

**Long Island Railroad, New York, N. Y.**, has ordered forty motor passenger cars and fifteen motor passenger and baggage cars from the American Car & Foundry Company.

**Schenectady (N. Y.) Railway** has announced that rolling stock items during the next three years will involve the following expenditures: new cars, \$54,000; remodeling cars, \$42,000, and new trailers, \$30,000.

**Galveston-Houston Electric Company, Galveston, Tex.**, will purchase new car equipment with part of the proceeds of an increase in the capital stock of the company which is to be authorized at a special meeting of the stockholders on Oct. 6, 1913.

**Louisville (Ky.) Railway** is completing in its shops several trailers of a new design, with entrance and exit at the center of the car instead of at the ends. In the event that the company finds them advantageous, it is probable that the motor cars will be designed along the same lines. The company expects hereafter to build all of its own cars at its new shops, which are now nearing completion.

**Brooklyn (N. Y.) Rapid Transit Company**, as noted in last week's items in this department, has received the approval of the Public Service Commission to ask for bids on steel subway cars. This approval is subject, however, to possible modifications in equipment. In the meantime the company has sent specifications to the principal car builders asking them for bids on 100 cars with the option to increase the order to 600 within twelve months after ordering the first lot. The principal features of the specifications follow:

Type of car.....	multiple side-door subway service
Seating capacity.....	78 to 98
Approximate weight including equipment.....	121,900 lb.
Weight car, body only.....	83,165 lb.
Bolster centers, length.....	47 ft.
Length of body over coupler faces.....	67 ft. 3½ in.
Width over side sheets.....	9 ft. 9 7/16 in.
Height, rail to top of roof.....	12 ft. 3 in.
Height, rail to sills.....	3 ft. 9 11/16 in.
Body, side frame.....	pressed steel
Interior trim.....	Agasote or equivalent and steel
Headlining.....	Agasote or equivalent
Roof.....	modified monitor with no ventilator sash
Underframe.....	steel channels

Operating equipment and miscellaneous fixtures have not yet been specified.

## TRADE NOTES

**Cincinnati Car Company, Cincinnati, Ohio**, has recently constructed ten all-steel interurban cars for the Union Traction Company of Indiana. These cars were described in the *ELECTRIC RAILWAY JOURNAL* for Sept. 27, but through an oversight the name of the Cincinnati Car Company was not mentioned as the builder of the new equipment.

**H. F. McConnell, New York, N. Y.**, has withdrawn from the firm of Williams, McConnell & Coleman, 60 Wall Street, and formed a co-partnership with W. F. Preston and F. W. Langhorst, former employees of the old organization under the name and style of H. F. McConnell & Company, 25 Pine Street, New York. The new company will buy and sell investment securities, particularly public utility issues, on a commission basis or otherwise.

**Johnson Fare Box Company, New York, N. Y.**, has changed its New York office from 1239 Fourth Avenue to 30 Church Street. This company has received orders for registering fare boxes from the following railways: International Railway, Buffalo, N. Y.; New York State Railways, Rochester, N. Y.; Grand Rapids (Mich.) Railway; Union Railway, New York, N. Y.; Yonkers (N. Y.) Railroad; Westchester Electric Railroad, Mount Vernon, N. Y.

**General Railway Signal Company, Rochester, N. Y.**, has received a report showing that its automatic electric block

signal installation on the Toronto, Hamilton & Buffalo Railroad was the means of averting a serious accident. A section of steel rail about 3 ft. in length was discovered broken. This break, however, by opening the track circuit connected with the signals, caused the block signals to indicate danger, and thus prevented an approaching train from being ditched.

**Railway Utility Company, Chicago, Ill.**, has received an order to install utility electric thermometer control in eighty cars of the Chicago City Railway which are now undergoing reconstruction in its shops. This item is a correction of one which appeared in last week's issue of the *ELECTRIC RAILWAY JOURNAL*, in which it was stated erroneously that the railway installing this thermometer control was the Chicago (Ill.) Railways. The company has also recently received an order from the Chicago City Railway for the Utility Honeycomb type ventilators for 125 near-side cars. The system of ventilation for these cars will be a combination of Utility Honeycomb exhaust ventilators with a mechanical fan used in the Cook system of car ventilation.

**Packard Electric Company, Warren, Ohio**, has recently placed on the market a new type of transformer. The standard cruciform type of core is employed, but by an ingenious design of yoke the company has been able to provide good interior ventilation by means of ducts and thus insure a supply of cool oil in the interior of the transformer where it is most needed. This feature makes it possible to operate the transformers under more severe conditions and higher overloads than would otherwise be possible. Besides this arrangement a special form of core is used which eliminates cross-magnetization. All secondary leads are brought out through a single strong porcelain bushing which has the effect of reducing stray magnetism in the iron cases and thus improves the copper losses and regulations.

**Manning, Maxwell & Moore, Inc., New York, N. Y.**, have appointed Henry Evans chairman of the executive committee and acting president of the firm. Mr. Evans was formerly president of the Continental Insurance Company. This firm has purchased the capital stock of the Putnam Machine Company, Fitchburg, Mass., which makes heavy railroad machine tools. The Putnam company will retain its name and be operated on its own identity, as are the various other subsidiaries of Manning, Maxwell & Moore, Inc. By the purchase the old officers and directors of the Putnam company automatically ceased to hold office and the following are now directors: Salmon W. Putnam, Alfred J. Babcock, John N. Derby, Percy M. Brotherhood and George D. Branton, the last four being executive officers of Manning, Maxwell & Moore, Inc.

## ADVERTISING LITERATURE

**Trump Manufacturing Company, Springfield, Ohio**, has issued a catalog describing and illustrating its turbines.

**Ohio Brass Company, Mansfield, Ohio**, has issued a folder describing its National open-mesh railroad trolley guard.

**National Tube Company, Pittsburgh, Pa.**, has issued its N. T. C. Bulletin, No. 16, which describes and illustrates the tests to which its boiler tubes are subjected.

**Niles-Bement-Pond Company, New York, N. Y.**, has issued the *Progress Reporter* for September, 1913, describing and illustrating its recent types of lathes, milling machines, surface grinders and vertical shapers.

**General Electric Company, Schenectady, N. Y.**, has issued Bulletin No. A4137, describing and illustrating its Curtis steam turbines of 100-kw to 2500-kw capacity for driving sixty-cycle generators at 3600 r.p.m. These generating sets are of the horizontal-shaft, rigid-frame type, and either two or four impulse wheels are used, depending upon the capacity of the ventilator. Bulletin No. 4972 describes the K R system of voltage regulation, which can be successfully employed on systems having such large fluctuations of voltage that the standard method is ineffective. The K. R. system gives a broad range of excitation and the amount of voltage it can furnish the fields of the main alternators is not limited either by the voltage range of the main exciters or the amount of current flow interrupted by the contacts of the regulator.