

Electric Railway Journal

Vol. XLI

NEW YORK, SATURDAY, MARCH 22, 1913

No. 12

PUBLISHED WEEKLY BY

McGraw Publishing Company, Inc.

JAMES H. MCGRAW, President. C. E. WHITTLESEY, Secretary and Treas.
239 West 39th Street, New York.

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

TERMS OF SUBSCRIPTION

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

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

Copyright, 1913, by McGraw Publishing Company, Inc.

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

Of this issue of the ELECTRIC RAILWAY JOURNAL 8000 copies are printed

INDUCTIVE DISTURBANCE STUDIES

In last week's issue an account of the preliminary work of the joint committee on inductive disturbances organized under the auspices of the California State Railroad Commission was given. The causes of neither electromagnetic nor electrostatic disturbances are by any means well understood notwithstanding their practical interest to electric railways on account of the rapidly increasing use of signal and telephone systems. Yet there must be considerable information on this subject stored in the archives of telephone, telegraph and power companies. The failure of the commission to find any considerable amount of data in accessible form indicates also that an effort should be made to collate the records now in existence and to encourage research which will bring out additional facts. Hence the commission's plan of getting together the various branches of public service interests which are concerned in the matter is a logical one. A public service commission furnishes most desirable auspices for the conducting of such tests as are outlined; in fact, no other body is in a position to bring out unbiased information so efficiently. The result can but conduce to harmony among otherwise conflicting interests.

SURPLUS AND DEFICIT IN CLEVELAND

The student of the reports of financial operations of the Cleveland Railway can consider them in either one of two ways. He can take the statement of income account based on the actual disbursements, which showed for the calendar year 1912 a net deficit of \$38,935, or he can take the results based on the car-mile allowances prescribed in the ordinance for operating expenses and maintenance and discover a surplus of \$110,418. Thus there exists a difference of \$149,353 between the results of the two methods. The reason for the discrepancy indicated is that the Tayler ordinance names the specific rates per car mile which the company shall be allowed to deduct from

earnings and use for operating expenses and for maintenance. The actual expenditures for these purposes exceeded the ordinance allowances in 1912 by \$149,353. In 1911 a deficit was shown under both methods of accounting, but the actual deficit resulting from the disbursements was larger than the bookkeeping deficit which the accounts showed when compiled according to the ordinance allowances. As between the two methods it is, of course, the actual results which measure accurately the operations of the property. An arbitrary car-mile allowance of expenditure is an end toward which a company can aim. If it does not reach this end, its results of operation are not those which were prescribed for it, but those which its actual disbursements show.

THROUGH ROUTES AND RATES IN ILLINOIS

The Illinois Traction System, seeking through routes and rates with the Peoria & Pekin Union Railway, has secured an opinion from the Interstate Commerce Commission directing that its request be acceded to. The opinion of the commission shows that the position of the electric railway was reasonable and the position of the terminal company was unreasonable. The electric line has ample terminal facilities in Peoria, passenger as well as freight, but it needs facilities for the interchange of traffic with steam lines and needs, furthermore, to be able to reach the various industries in the city, more than half of which have private switch connections with the tracks of the terminal company only. The terminal company is controlled by ownership of stock by steam railway companies and took the ground that its property was private, but that the electric railway system could make use of that relatively small part which it desired by a payment calculated on the same basis followed in the cases of those railways which use all of the property of the terminal company, including passenger and freight stations, storage yards, etc. In other words, the Illinois Traction System could use a small part by paying for the whole. This, of course, was equivalent to a denial because no line could afford such an arrangement. It imposed too heavy a terminal charge on the business. The position of the electric railway was sound and entirely tenable. If it had sought the use of already overcrowded passenger and freight terminal buildings to avoid the construction of facilities of its own, its argument would have been less likely to succeed. But it sought merely the use, in common with other carriers likewise engaged in interstate commerce, of the track and interchange facilities of the company which, in the language of Commissioner Meyer, "practically controls the use of Peoria as a gateway for interstate traffic." The increase in the number of through route and rate arrangements which are in operation between electric railways and steam carriers in various sections of the country is slow, but it is a tendency that is amply justified on economic grounds and by the decisions

of both courts and commissions. The order of the Interstate Commerce Commission in the Peoria terminal case will benefit the Illinois Traction System directly and materially. It will also strengthen the hands of other electric railways which are trying to secure through routes and rates with steam railways.

EDUCATION OF PUBLIC SERVICE COMMISSIONERS

When the first public service commissions were created by New York and other states many corporations feared the consequences of granting almost autocratic powers to men who came into office with no practical knowledge of the properties they were to administer. It would be fatuous optimism to assert that no public service commissions have subjected the corporations under their control to needless expenditures and impracticable orders, but there is evidence in plenty that time and experience are gradually bringing the commissions and public service corporations to a better understanding of each other's viewpoints and responsibilities. This happy tendency is clearly indicated by the recent addresses of Messrs. Hale and Olmsted, as reported in this issue, and in a recent statement of F. W. Stevens, chairman of the New York Public Service Commission, Second District, noted in the *ELECTRIC RAILWAY JOURNAL* for March 1. Mr. Hale, who is a member of the Connecticut Utilities Commission, took occasion to point out in a specific case the incompatibility of lower fares with good service.

Mr. Olmsted, in his address, frankly confessed that he had entered office as a commissioner of the Public Service Commission, Second District, New York, with anti-corporation views. Experience had taught him, however, that most corporations were willing to give the public all that was possible within their financial means. The fact that less than one-quarter of the public service companies in his territory could pay dividends was a significant contradiction of the general impression that they were mines of Golconda and Kimberley combined. Finally, the commission had found that it could do more good by bringing the public and the corporations together than by brandishing the "big stick" of its tremendous powers. Mr. Stevens' address, which was delivered before the New York Electric Railway Association, laid particular stress on the endeavors of the commission to be patient and just with each side in controversy.

In this connection, it is a matter of deep regret to note that the curse of political rotation in office has already led to the retirement of Mr. Olmsted, while the end of Mr. Stevens' service is expected at an early date. Surely it is a great injustice to the public and the corporations alike to refuse reappointment to public officers at the very stage when they have become thoroughly acquainted with their duties. The late retirement of Chairman Willcox of the New York Public Service Commission, First District, just before he was ready to sign a transit contract involving more than \$300,000,000, was a most flagrant example of the disregard of public welfare which is imposed by the American party system. The present duty of public service corporations, therefore, seems to be not so much a matter of protesting against the principle of state supervision by com-

missions as one of advocating that public service commissioners should be appointed under somewhat the same conditions as Supreme Court judges, namely, for long terms or with life tenure subject to good behavior.

WHEN A REDUCED RATE OF FARE SHOULD NOT BE MADE

One of the unjustifiable theories of electric railway rate-making in the early days of the industry was responsible for a reduction in the fare during the rush-hour periods in one or two cities. A similar illogical method of rate-making is illustrated in the temporary arrangement now prevailing in Toledo. If a company departs from the flat rate of fare principle, it ought not to depart in any such way as this. It ought to maintain its rate of fare during the rush-hour periods because it has all it can do in these periods anyway to handle the inevitable heavy movement of traffic between homes and places of work. When it offers a low rate of fare during rush-hour periods it simply encourages the crowd; it lessens the traffic during the non-rush periods and increases the traffic during the rush periods. If a company wants to differentiate in its fares between the rush periods and the non-rush periods, the reduced rate of fare should fall in the non-rush hours.

Variable rates at different hours of the day for the same haul are perfectly logical and may be adopted generally when the ideal system of electric railway rate-making is developed; but, if so, they should be made on a justifiable basis. They should correspond in principle to the rates of the steam railroad for twenty-eight-hour and twenty-hour service, respectively, between New York and Chicago, and to those of the central station for off-peak business. That is to say, the passenger who wants to use the facilities at the time when the greatest demand for their use naturally exists should pay more than the one who is willing to ride when the demand is light. The passenger who rides during the periods of heavy demand does so because his convenience is served thereby; but this is the same motive that leads nearly all of the passengers to ride during the same periods. The passenger who travels when the cars carry light loads uses the facilities of the company when the total capital investment is at a low point of productiveness and when an extra inducement to ride can best be afforded, if it can be afforded at any time. In city railway management it has not appeared practicable to vary the facilities for service and to introduce a form of graded fares therefor, corresponding to the rates charged for Pullman or for ordinary coach transportation on steam railroads. Nor has a city company the trackage necessary to introduce the equivalent of limited trains to meet a greater degree of convenience for the passenger at the price of an excess fare. The possibilities in the direction of variable service and variable rates of fare for an unlimited haul are restricted to variation in the time of day when the service is used.

It is for the reasons outlined that we conclude that there ought not to be a higher rate of fare to discourage riding during the middle of the day, when the demands on the facilities are reasonably light, and a lower rate of fare to encourage riding during the busy period of the day, when

the demands are all that the average company can meet with the trackage available in the congested centers of the city. In fact, if there is to be any divergence whatever from the uniform rate of fare principle, the most logical course is a complete new fare scheme having as its primary basis rates proportioned to the distance traveled.

PROPER RECOGNITION FOR "GOING VALUE"

Those who have difficulty in realizing the expenses of developing a public utility business or the hazards which are encountered during the early history of an electric railway can have a practical illustration of the situation in the rapidly developing communities in the Far West. When "going value" is studied in the older and more stable cities of the East, it often seems to theoretical students of financial values that the ultimate growth and its rapidity and direction in each city, as well as the need for transportation facilities, must have been obvious from the beginning.

There is no reason, however, to believe that such was the case, and the testimony of those railway men whose experience dates back to the times when the Eastern cities were much smaller than they are now furnishes corroborative evidence of this fact. But in the Far West cities are still in their making, and one may now see there in one year a duplication of the events which the more slowly growing cities of the East have taken years to accomplish. As under a microscope, the various steps in the development of a city are unfolded, and a new conception may be had of the great opportunities for errors in judgment and the hazards of the transportation business.

One of these hazards, of course, is the future of the city itself. Given a certain population at a certain time, will that population grow 10 per cent or 100 per cent during the next year, as many cities in the Far West have done, or will it diminish in perhaps the same ratio? After a city has reached a certain size its permanence and the certainty of its growth are fairly assured, but local transportation enterprises cannot be held in abeyance until that time arrives. If the conservative financier waits, more venturesome promoters will have entered the field with the hope of large returns.

Still another hazard, even in an established or rapidly growing community, is the direction of growth. This cannot be positively foreseen. If it could, real estate investments in each city would be as safe as government bonds. Surrounding each community, large and small, in the Far West, in every direction, are real estate enterprises, all demanding rapid transit service and all holding forth the promise of a large population in the early future. Some are destined to succeed, while others will surely fail. An investment in any public utility enterprise in such a community runs the same risk as does an investment there in real estate. If the expected results fail to materialize for reasons which cannot be predicted in advance, the cost of establishing the public utility is lost, either in part or entirely, as has been the case in many instances. If the venture should happen to be a fortunate one, the real estate operator reaps a large profit, and the public utility investor should be entitled to like return.

It may be argued that such gain for some reason is

proper to the speculator in real estate, but not to the railway promoter; that it is against public policy that the public utility promoter in successful ventures should earn more than 6 per cent or 10 per cent or 15 per cent on his investment, and that because he uses the streets he, in some way, forfeits his opportunity to profit with others who run equal or less financial hazards in developing town sites. If this is to be the settled policy of the future, it is needless to say that it will greatly retard, if not absolutely prevent, the establishment of the kind of communities of which we are speaking. Their development, not to say their existence, depends upon easy communication with other towns as well as upon a supply of light and water. If the installation of these utilities is prevented by a limitation upon the possible return, the home seekers will remain in the established cities or will seek other states where a more liberal policy prevails. It was the belief on the part of the builder of local railways that he would profit with the real estate operator which led to his investment in such enterprises in the past, and a denial of this claim is already being seen in the diminishing rate of railway extensions and new enterprises in all parts of the country. This will inevitably be followed by a corresponding retardation of the development of new towns.

The Far Western roads show, also, frequent examples of railway equipment outgrown before it is worn out. Obsolescence was brought about in part by the development of the art and in part by municipal enactments forced by public opinion. The smaller cars are physically as good to-day as ever, but they are of little value for practical use. In some cases, indeed, ordinances have been passed prohibiting their use. Similar conditions prevail in the power and generation and transmission systems and in other departments of a railway plant. The results could not have been foreseen, any more than one can predict at the present day the type of car or prime mover which will be used ten years from now, in spite of the belief of some persons that railway equipment is now standardized. The fact is that the electric railway is still in the formative stage, and no one knows how long this period will last. Hence the cost of obsolescence is and will be for some time to come a serious charge on railway operation. There is no escape from the purely accounting deduction that this charge must be met in the future in one of two ways, namely, either in the capital account or by its recognition as an extra hazard in railway enterprises for which there should be a correspondingly large return on the capital invested in the undertaking. As regards the past, we have always felt that as obsolescence has been until recently considered as a proper capital charge, and as various obligations have been assumed by railway companies upon this basis, past charges to capital account due to obsolescence of the equipment should be permitted to remain unchallenged.

The question of the past is one which concerns all companies, but that of the immediate future is particularly pressing on the Pacific Coast, on account of the demands of the public for an expansion of rapid transportation facilities. However, but little can logically or fairly be done by the companies in this direction until this question of a definite and adequate recognition of going value is settled.

The Washington & Old Dominion Railway

A Typical Suburban Steam Road in Northern Virginia, with a Single-Track Length of About 60 Miles, Has Been Electrified and Its Entrance Into Washington Has Been Changed

BY W. N. SMITH, CONSULTING ENGINEER OF THE COMPANY

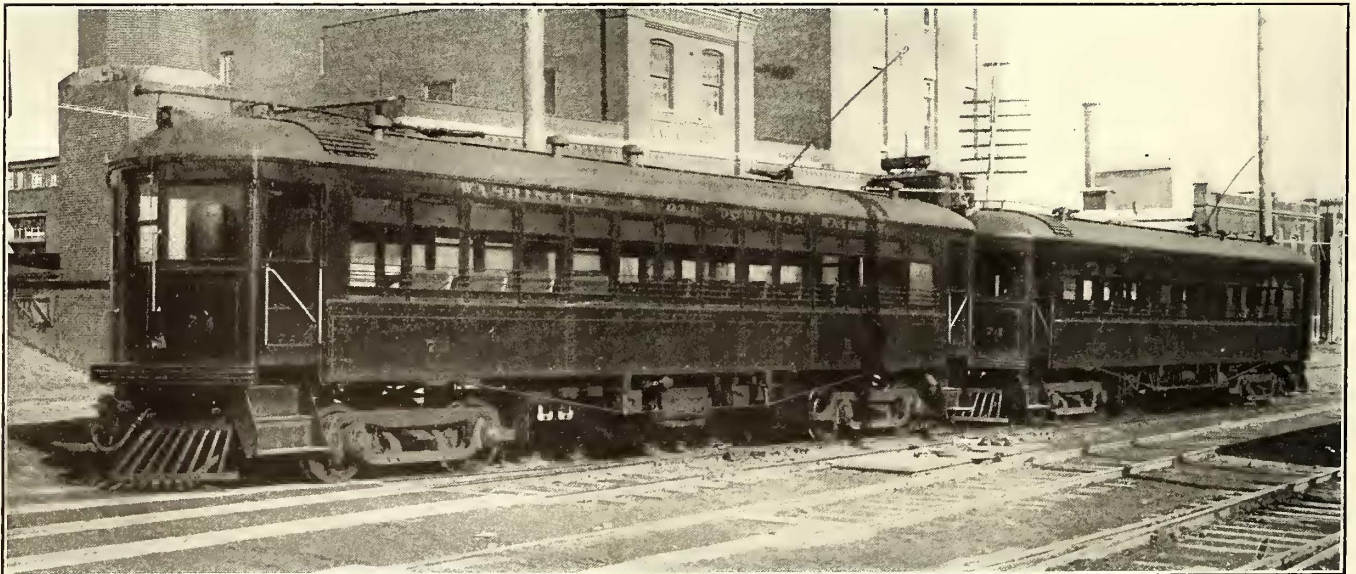
The latest example of the change in motive power from steam to electricity is the Washington & Old Dominion Railway, now extending from Washington, D. C. (Thirty-sixth and M Streets, N. W.), to Bluemont, Va.

This company, formed in 1911, took over from the Great Falls & Old Dominion Railway the double-tracked trolley line from Washington to Great Falls, 14.1 miles; leased from the Southern Railway the single-tracked steam line extending from Alexandria to Bluemont, 54 miles, and connected the two with a new double-track cut-off 3 miles long, extending from a point 2 miles out from Washington on the Great Falls line to Torrison station, now called Bluemont Junction, 7 miles out from Alexandria on the Bluemont line.

The original Great Falls & Old Dominion Railway was built in 1905-6 and double-tracked several years later. When

the past two or three years it has required a ten-minute schedule of cars for the first 7 miles out from Washington in the morning and evening rush hours. There is every indication that the newly accessible region along the cut-off will develop into an equally attractive and popular residence section and the tendency of the Washington residents, particularly those employed in the government departments, to build modest homes in the beautiful country immediately adjacent in Virginia will be further encouraged by the facilities afforded by the newly combined system, which not only embraces a number of towns with a commuter traffic already existing but makes it much easier than formerly for these residents to circulate to and from the metropolis.

A considerable area in Alexandria, Fairfax and Loudoun Counties is now provided with more convenient suburban



Washington & Old Dominion Railway—Two-Car Train with Multiple-Unit Equipment

built, it traversed virgin territory with no villages or community development of any kind along its route. But the suburban development which it made possible was rapid, and in the first six years of its existence it created a permanent and growing suburban community and more than doubled its original equipment, in order to take care of it. The grades are heavy, from 2 to $3\frac{1}{2}$ per cent.

The steam railroad to Bluemont was built from Alexandria to Purcellville in the fifties. The heaviest grade is $1\frac{1}{2}$ per cent, and though there is considerable curvature, all the curves are easy. The rails are 60-lb., but will gradually be superseded by a heavier section.

The cut-off connecting the two lines was built last winter and spring and was placed in service June 30. It is a typical example of standard present-day railroad construction, with 70-lb. A. S. C. E. rails, ties 7 in. x 8 in. x 8 ft. 6 in. on 2-ft. centers, with 6 in. of stone ballast under the ties. The joints have six-bolt angle bars, and are bonded with single No. 0000 concealed bonds compressed terminal type.

PRESENT SERVICE

Mention has been made above of the creation and rapid growth of suburban traffic on the Great Falls line. For

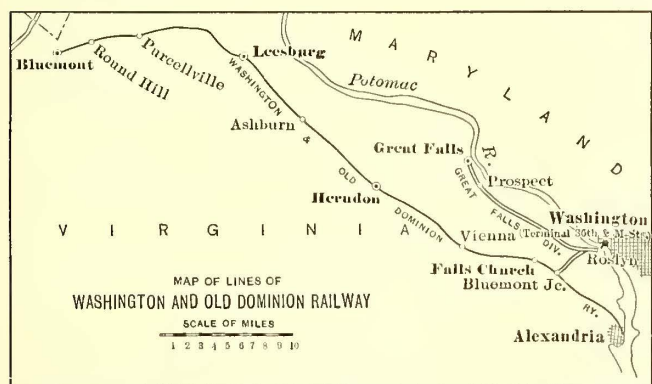
traffic facilities than ever before. Formerly all the steam railroad traffic from these northern Virginia counties entered Washington by the Union Station, the location of which is not convenient to many of the government offices. The traffic arrangements between the Union Station and the railroads entering it were not such as to encourage short-haul, low-fare suburban traffic and a real need existed for a new means of bringing the beautiful and healthful countryside of northern Virginia close enough to the administrative center of Washington to make the former readily accessible as a home for the workers in the latter. This want is now filled by the Washington & Old Dominion Railway, whose city terminus is at least 5 miles nearer the suburban district than is the Union Station. This enables its passengers to step out of its own cars and into the Pennsylvania Avenue city cars without loss of time, saving the additional time and fatigue of walking through the magnificent distances of the Union Station between railroad and trolley cars.

At its Thirty-sixth and M Streets station the railway has completed the erection of a steel-frame train shed, 50 ft. x 100 ft., remodeled the waiting rooms, ticket offices, baggage

facilities, etc., and established its trainmaster's and train dispatcher's offices.

In like manner the entrance and exit of express, package freight and milk traffic will be facilitated as soon as a suitable rearrangement of the Thirty-sixth and M Streets terminal can be made.

This business, like the passenger traffic, will all be handled with electric motive power. For the present,



Washington & Old Dominion Railway—Map

however, the regular carload freight traffic of the Bluemont division will be handled by steam locomotives and will be interchanged with the other railway systems at the Potomac yards near Alexandria, as heretofore. Ultimately it is probable that electric locomotives will be employed for all freight train service. The freight business increased appreciably in the last year, requiring two regular trains each way every day instead of one.

The passenger train service on the Bluemont line, with steam motive power, consisted of four trains each way a day, one of which ran to and from Leesburg and three to and from Bluemont, schedule speeds being from 20 to 25 m. p. h. Since the change in motive power there are now run five trains a day each way to Herndon, five to Leesburg and five to Bluemont, some being of one and some of two cars per train. There are also twenty-four trains each way between Washington and Bluemont Junction.

Traffic still being very light on the 7 miles between Bluemont Junction and Alexandria, this section has not yet been electrified, but a steam shuttle service is maintained at sufficient intervals to make all necessary connections between Alexandria and the upper end of the line. Before describing the electrical equipment it may be well to dwell upon some of the conditions which governed the development of the system employed.

It was not considered necessary or desirable to attempt high speed. It was believed that all purposes would be better served by increasing the frequency and reliability of the service than by attempting to shorten the time.

The presence on the Great Falls line of a considerable quantity of 600-volt d.c. electrical equipment in good condition, and the desirability of having equipment that could operate on city tracks in Washington, influenced the decision to retain that system for the electrification of the Bluemont division. In this way the company was able to insure uniformity of equipment and a higher degree of reliability than could be guaranteed for a high-voltage d.c. system in the state of the art at the time.

The ownership of a power station fundamentally good, though with a few defects that could readily be corrected, influenced the decision to continue to generate power rather than to purchase it, thus maintaining the entire property on a perfectly independent basis.

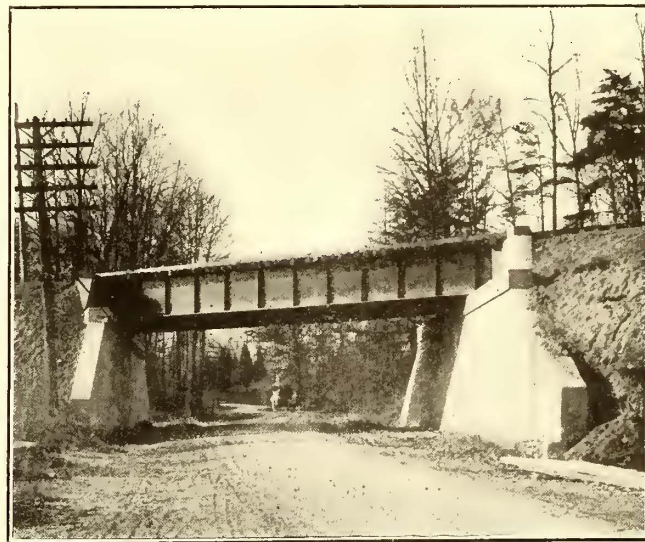
The question of handling freight trains by electric power was left open for the present, as certain future possibilities are bound up with it which have not reached the stage of active development.

EQUIPMENT PLANS

The electrical equipment of the Great Falls line consisted of a power station at Rosslyn, Va. (opposite Washington), on the Potomac River, containing one 500-kw and one 750-kw turbo-generator, with two 500-kw rotary converters and three 125-kw raising transformers, which last supply 22,000-volt, three-phase current to a transmission line feeding one rotary converter substation at Spring Hill, 10 miles distant. The substation contained two 300-kw rotaries, with one bank of 110-kw transformers, one rotary only being used at a time except on summer holidays. The rolling stock comprised twelve large and two small passenger cars and one freight motor car. The larger cars are about 42 ft. long over all, the smaller ones about 30 ft. long and used only for traffic over the Aqueduct Bridge between Thirty-sixth and M Streets, Washington, and Rosslyn. There were several second-hand steam locomotives and trailer coaches that had been used occasionally but were in bad repair and were not taken into account in providing for the new arrangements.

The three newest passenger cars were fitted with multiple control, but all the other cars were provided with the old type of platform controller. As all of the passenger cars enter Washington, they are of necessity equipped with conduit trolley plows, though the stretch of track on which they are necessary is hardly more than a quarter of a mile long.

A careful weighing of the above conditions, including as they did the important matter of utilizing the existing conditions of entrance to the city of Washington and the disposition of operating equipment by no means obsolete and representing an investment of several hundred thousand dollars, combined with the greater cost, delayed delivery and indefinite operating cost of high-voltage equipment, resulted in the decision to adhere to the 600-volt d.c. system for equipping the Bluemont division. The same reasons led the company to retain and improve the existing power generating station at Rosslyn and to enlarging its equipment to suit the increased requirements. This conclusion was only reached after about a dozen different schemes and es-



Washington & Old Dominion Railway—Embankment Bridge on New Cut-Off

timates had been made and compared, covering a variety of combinations of voltage and of substation location. The final layout, upon which were drawn the specifications calling for all new apparatus, included for the power station one new 1250-kw turbo-generator, with auxiliaries; three 300-kw raising transformers, 390 to 33,000 volts, with oil circuit-breaker, electrolytic lightning arrester and suitable switchboard panels; four new rotary converter substation

equipments for fixed stations and one portable substation, all of 300 kw capacity, and twelve car equipments of four 60-hp motors each, with automatic air brake and multiple-unit control.

The spare rotary at Spring Hill substation was utilized in one of the new substations, but in other respects all the apparatus was new.

POWER STATION

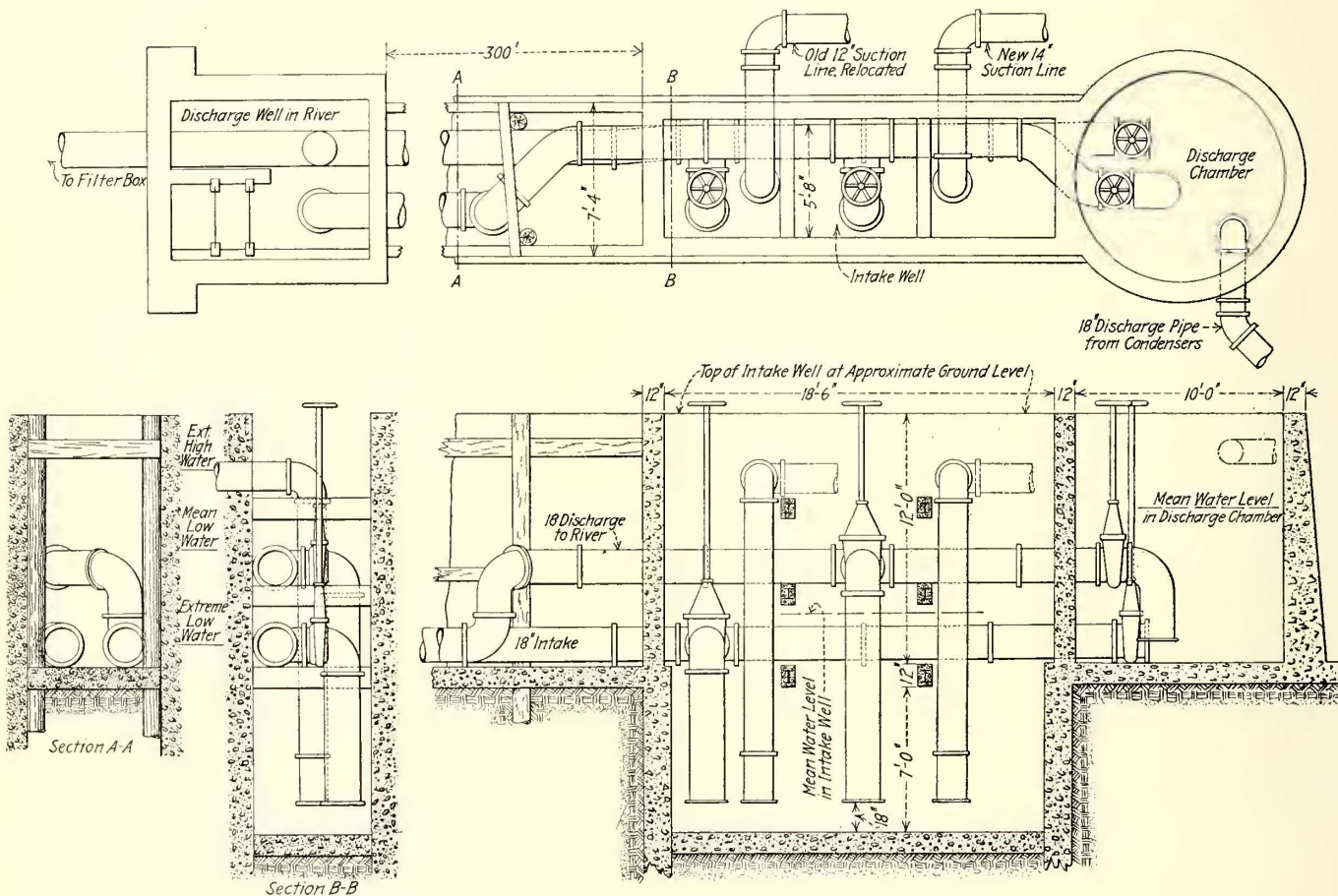
The power station presented several interesting problems in civil and mechanical engineering, owing partly to its location upon a rocky ledge on the edge of a mud flat of river silt and partly to the fact that the condensing water intake channel was too wide and shallow and the chimney of insufficient height.

The original intake channel, built of sheet piling, would probably have given little trouble either if the Potomac

mud at the outer end of the intake effectually preventing access of cold water from the river at such times. This makeshift arrangement had to be watched closely by the plant engineer at times of low tide, in addition to his other duties, and even then was not always effective, as the injection water would reach a temperature of 100 deg. or more.

The intake channel was of wooden sheet piling, and after six years' exposure to the elements was rapidly decaying. It was about 300 ft. long from the river end to the circular concrete well (about 200 ft. from the plant), from which the condenser injection pipe was laid to the circulating pumps. The intake well was of the same depth as the intake, and at low water considerable air and solid trash was sucked up into the condensers.

The obvious remedy was to provide a conduit for condensing water that would be of such size that the flow



Washington & Old Dominion Railway—Plan and Sections of Intake

River had been free from silt or if the power station had been large enough to require a quantity of condensing water sufficient to produce a rate of flow that would have kept the silt from settling in it. The intake was about 7 ft. wide, its bottom being about 5 ft. below mean and 2 ft. below extreme low water, the latter occurring when a northwest wind is simultaneous with low tide. As the condenser suction from the original plant consisted of but one 12-in. pipe and as the usual flow through this pipe was only about half its capacity, the current in the intake at ordinary tide levels was imperceptible, and the plant had run only a few months before the intake channel became effectively banked with mud at the river end. A few hundred dollars properly expended for lumber and labor would probably have overcome the silting, but after several years of intermittent shutdowns a cooling pond was created on the adjacent flat alongside the intake, in which could be stored a quantity of water that would carry the plant over one or two extra low tides by letting the pond water flow back into the intake and circulate through the condenser over and over again, the 4-ft. embankment of

would tend to prevent sedimentation, of a depth that would be effective regardless of the wind and the tide and that could be flushed if necessary by reversing the flow. At the same time due regard was had to possible increase in plant capacity and to eliminating the cost of maintaining the rapidly decaying timber intake, and most of all to reducing the cost of the improvement to a minimum.

Accordingly, about 20 ft. of the inner end of the old timber intake channel, next to the old circular suction well, was blocked off by a cofferdam (temporary injection piping being run around it) and the excavation deepened 6 ft. to form a new intake well in front of the old well. The new well was built of reinforced concrete, with walls about 1 ft. thick, and a concrete floor resting on piles, with several sets of horizontal struts or cross braces to prevent collapse of the sides, the braces being composed of I-beams incased in concrete and forming supports for the piping.

This new well is connected with the river by two independent lines of 18-in. cast-iron pipe in 12-ft. sections, flanged, faced and bolted, which rest on the concrete bottom of the old intake channel. Both lines run through the

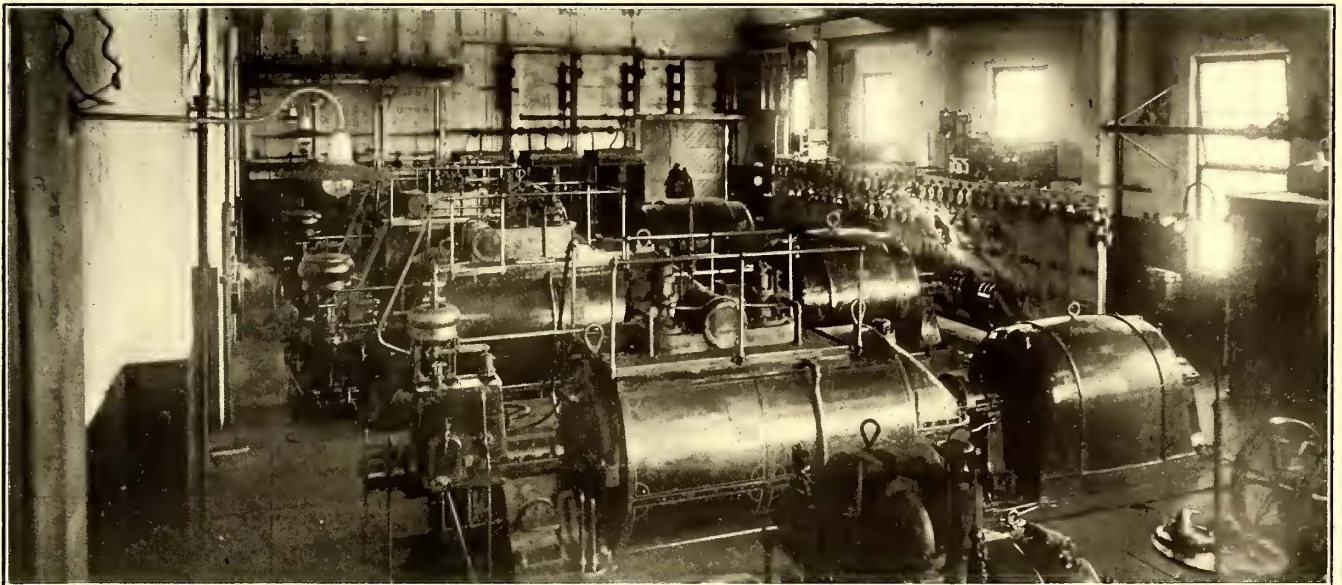
new well into the old well (the two wells being otherwise separated), and each pipe line can be connected to either well independently by an 18-in. gate valve, with hand wheel on the valve stem extending above the ground level. The old well is to receive all the condenser discharge water from the plant, through a line of 18-in. glazed terra cotta pipe.

The method of operation will therefore be to use one of the 18-in. lines as an intake pipe connecting the river to the new well, whence the condenser injection pipes lead into the plant, and to use the other 18-in. line as a discharge line from the old well to the river, all by proper manipulation of the four 18-in. gate valves.

The 18-in. line that will be generally used for the intake is extended about 100 ft. out into the river, ending in a steel box, 5 ft. x 10 ft. x 5 ft., in the upper part of which is formed a filter bed of gravel and broken stone, which will prevent trash from entering the pipe. The other 18-in. line terminates in a concrete crib at the river end of the present intake channel and will ordinarily be used as a discharge, but by lowering trash racks into position across the discharge opening this pipe line can also be used as an intake when it is desired to reverse the flow for flushing the other pipe, or for any other reason. The two pipes to-

such as forced draft, induced draft, balanced draft, a new stack and several types of mechanical stokers, and taking into account the extremely limited space in the boiler room, the uncertainty of the extent of future enlargement of the plant, the short time available for installation, the first cost and the guarantees of operating economy which would be backed up by responsible manufacturers, together with the ultimate value of the method adopted as a future asset, the company decided to adopt the Roney type of mechanical stoker, made by the Westinghouse Machine Company. The guarantees obtained with these stokers were that they would generate steam to the extent of 150 per cent of boiler rating, with coal averaging 14,500 b.t.u. and with the existing conditions of chimney draft. This postponed the building of a new stack until the plant should be further increased, obviated the necessity for changing the flue connections or adding fan apparatus and air ducts, for which it would have been difficult to provide room and which would not, *per se*, have improved the economy of operation. Further, it offered possibilities of reducing the coal consumption by anywhere from 10 to 20 per cent, it required but a comparatively short time to install and involved but a single responsibility and a small force of men.

The lack of draft above mentioned had worked a serious



Washington & Old Dominion Railway—Interior of Power Station

gether will furnish an ample supply for a plant of more than double the capacity of the present one, should its size ever be increased. The old wooden intake can decay and fall to pieces without in the least interfering with operation. The amount of wet excavation, in quicksand, was by this plan reduced to a minimum. The scouring effect of the discharge water is also utilized to prevent or retard the formation of a sandbar adjacent to the intake.

The progress of construction work on the new well was slower than had been estimated, because of the behavior of the underlying quicksand, the difficulty of securing suitable working equipment in Washington and the impossibility of working more than a few men at a time in a small excavation. The well is now completed, and the heavy pipe work along the old intake bottom, which requires a submarine diving outfit, is now under way.

RECONSTRUCTION OF BOILER PLANT

The boiler plant presented the problem of getting 100 per cent to 150 per cent of rating out of 1428 hp of Stirling boilers served by a stack 7 ft. in diameter and 125 ft. high. The prime difficulty was that the available draft of about 9/16 in. to 5/8 in. was insufficient to burn coal enough on the existing hand-fired grates to evaporate their rated amount of water. After making comparisons of various methods,

hardship to the boilers in this respect, that it had not been possible to get more than two-thirds to three-fourths rating out of any of them, and consequently made it less easy to shut down the boilers for cleaning. Under the initial operation, the load on the two original 276-hp boilers had called for more steam than one boiler could ever furnish, with the insufficient draft, and consequently the two boilers were worked for a considerable time without being out of service long enough to have their tubes cleaned. The result was that the two back rows of tubes in these two boilers were incrustated with more than 1/2 in. of very hard scale. The subsequent addition, first of another 276-hp boiler and, later, of a 600-hp boiler, relieved the situation somewhat; but the scale was so nearly indestructible that it was decided to remove and replace about fifty tubes in each boiler. This was done during the progress of the stoker installation.

Another improvement in the boiler room was the removal of the feed pumps to a separate pump room, built for the purpose alongside the boiler room, in which the pumps were placed at a level several feet below that of the boiler room to reduce their suction lift, and a new pump was added. A disused feed water heater was repaired and added to the system; a small auxiliary steam header was

installed to provide more flexibility in the use of the main steam header, and the pumps were fitted with independent hot and cold water suction connections and so connected that they could be used on house service lines also. The main 8-in. steam header was sectioned by inserting a gate valve in the middle of it. Six 36-in. galvanized Star type ventilators were placed in the concrete slab roof of the boiler room, which had hitherto been without adequate outlet for hot air. Provision was also made for covering all steam piping, which had been omitted from work done subsequent to the original installation.

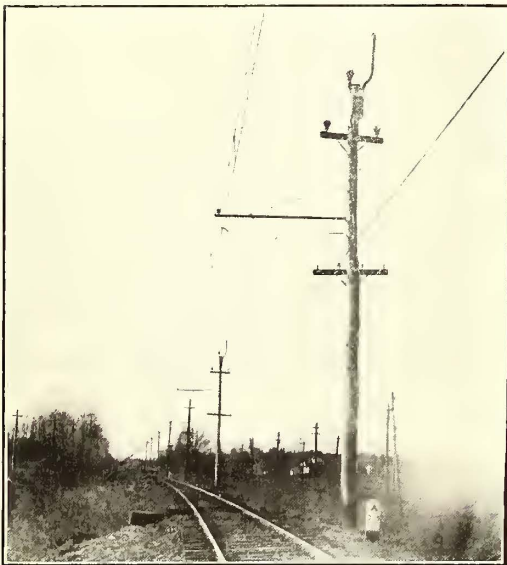
CHANGES IN ENGINE ROOM

In the engine room the two elevated jet condensers had been so piped that it was impossible to run more than one of them at a time, although each had its own circulating pump and dry vacuum pump. The piping of these pumps was changed to remedy this defect, making it possible for the first time to run the 500-kw and the 750-kw units in parallel. The principal work in the engine room was, of course, the installation of the new 1250-kw generator, with

piping material was nearly all furnished and the construction of nearly everything besides the intake piping was executed by the Benj. F. Shaw Company, of Wilmington, Del. This work included the steam, exhaust and water piping, also oil-cooling and gland water supply for turbine and condenser, the new system of piping for the feed pumps, auxiliary steam header, house service lines and suction piping as far as the new well. From this point the 18-in. piping, though furnished by the Shaw company, was installed by the railway company's own force.

ELECTRICAL EQUIPMENT IN POWER STATION

The electrical details of the power station are simple and in accordance with standard practice and need no special description. The new 300-kw transformers are of the oil-insulated, self-cooling type, delta-connected. The 33,000-volt outgoing circuit is controlled by a hand-operated automatic circuit-breaker, mounted near the switchboard in the usual cell structure of pressed brick. The electrolytic lightning arresters are on the roof. The generator voltage is 390, twenty-five cycles, feeding directly into rotary con-



Washington & Old Dominion Railway—Overhead Construction and Freight Motor Car with Standard Railroad Baggage and Mail Car

its condenser, the additional raising transformers, switchboard panels and motor generator exciter.

There was barely room in the engine room for the new apparatus, but the only difficult part of the work was the excavation and lining of the pit that was required to accommodate the new condenser. The contract for the new turbine had, with all the other electrical apparatus, been placed with the Westinghouse Machine Company, which furnished a Le Blanc condenser with the turbine. This necessitated a pit nearly 7 ft. deep below the engine room basement floor level, which was solid rock and of a particularly refractory kind of granite. It had to be blasted, but of course with very small charges to prevent damage to the building and contents. It took nearly four weeks of constant labor to make an excavation about 10 ft. x 15 ft. to the proper depth.

The new condenser was so connected that it could be used on either the new 1250-kw or the old 750-kw unit, as it is a more economical machine than that originally attached to the latter. A new hot well was constructed outside the building to which the discharge from all the condensers is led and from which the boiler feed is ordinarily drawn. This hot well overflows through a line of 18-in. terra cotta pipe to the old well next the intake, as above described.

As may be inferred from the foregoing, much of the engineering in the power station was concerned with the design and construction of steam and water piping. The

verters placed in the engine room, which supply the adjacent parts of the line, as well as into the old and new sets of raising transformers.

The new 33,000-volt transformers are placed alongside the old bank of 22,000-volt transformers, which are still used to supply the substation on the Great Falls line.

A new motor-driven 15-kw exciter was added to the former exciter equipment. Sundry improvements were made in the building, including two ventilators in the engine room roof and a complete new roof covering of Ehret four-ply tar, felt and slag roofing over the entire building.

OVERHEAD CONSTRUCTION

The overhead construction of the new line is of the single-bracket type, on wooden poles, which carry the high-tension line also. The catenary type of trolley construction was adopted and was made as simple as possible in all its details. Wheel trolleys being used on the cars, there is no special necessity for a very tight trolley wire. The normal pole spacing is 150 ft. on tangents and on curves up to 3 deg. The total amount of new construction erected is 47 miles of single track, 3 miles of double track and 4 miles of sidings for passing and freight tracks.

The poles are of chestnut, mostly cut in the region adjacent to the line. They average 22 in. circumference at the top and 44 in. 6 ft. from the butt for the standard 40-ft. pole required for combined trolley and three-phase transmission construction.

At curves all poles on the outside of the curve are guyed

to permanent guy anchors. Poles on the inside are cross-guyed to guy poles set directly opposite, which are also permanently back-guyed.

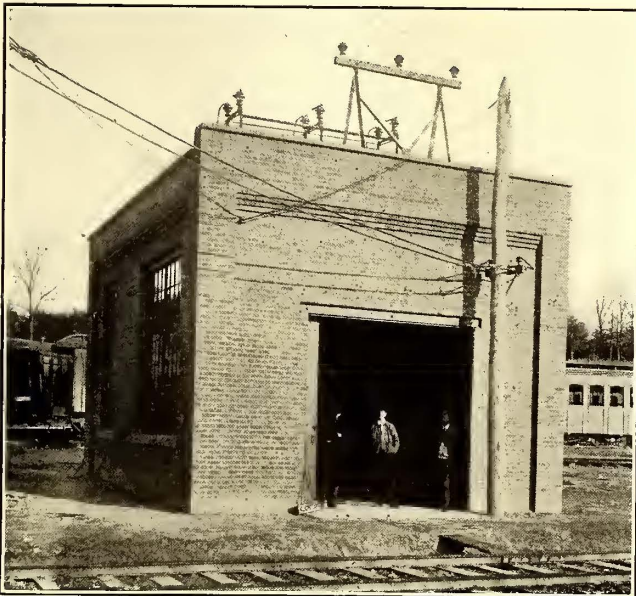
The characteristic features of straight-line construction are shown in the accompanying halftone. The spacing of the 33,000-volt wires is 48 in. and a 5/16-in. galvanized steel ground cable is stretched over the high-tension wires throughout their full extent. The insulators are Pittsburgh porcelain, triple-petticoat, with a dry flash-over test voltage of 100,000 and a wet flash test of 70,000. By reason of the lightness of the conductor section no special construction of strain insulators is needed, beyond the doubling of cross-arms, pins and insulators on curves and such few dead ends as are required. The transmission conductors are of No. 3 B. & S. solid hard-drawn copper. Burke type high-tension outdoor sectionalizing switches have been installed on the 33,000-volt line, allowing the high-tension line to be cut off west of any substation, which in case of trouble with high-tension line enables the operation of a line car directly to the seat of any trouble and eliminates the use of hand cars or gasoline cars and the delay incident thereto.

The trolley wire is of No. 0000 B. & S., carried by a 7/16-in. Siemens-Martin steel messenger, the hangers being spaced at 30-ft. intervals and of the Westinghouse drop-forged type. On curves up to 2 deg. no pull-offs are employed between poles. One 300,000-circ. mil copper equivalent aluminum feeder is run the full length of the line.

The poles were furnished by L. A. Clarke & Son, of Washington. The steel and copper cables and wires were furnished by the American Steel & Wire Company, and the overhead catenary trolley and high-tension details by the Westinghouse Electric & Manufacturing Company. The work of erecting all poles, high-tension and trolley construction was let to Smethurst & Allen, contractors, of Philadelphia.

RAIL BONDING

Rail bonding presented an unusual problem, because the 60-lb. rails on the Bluemont line had splice bars that af-



Washington & Old Dominion Railway—Substation at Bluemont Junction

forded no room for concealed bonding and because the management proposed to replace these rails gradually with heavier ones. This track was therefore bonded with the twin-terminal type of bond, which was installed by the American Steel & Wire Company. On the new cut-off, where standard 70-lb. rails and splices were used, the protected type of compressed terminal bond was employed.

SUBSTATIONS

There are four new permanent substations located, respectively, at Bluemont Junction, Herndon, Leesburg and Round Hill. There is also a portable substation, intended to be used for the most part at Vienna, between Bluemont Junction and Herndon, at all times except when needed elsewhere as a relay.

The substation buildings are of uniform pattern, built of



Washington & Old Dominion Railway—Interior of Passenger Motor Car

brick, with concrete floor structure and roof of thin reinforced concrete slabs laid on steel I-beams and covered with Ehret four-ply felt, tar and slag roofing. The window frames are of the steel Fenestra type. The buildings are each designed to contain one 300-kw rotary converter, with transformers, 30,000-volt oil-switch structure and switch-board. The high-tension choke coils are hung on insulators supported from the ceiling and the lightning arresters, of the aluminum type, are on the roof. The buildings are so designed that they can be readily enlarged when it becomes necessary to increase their capacity.

The Bluemont Junction substation is shown in an illustration on this page.

ROLLING STOCK

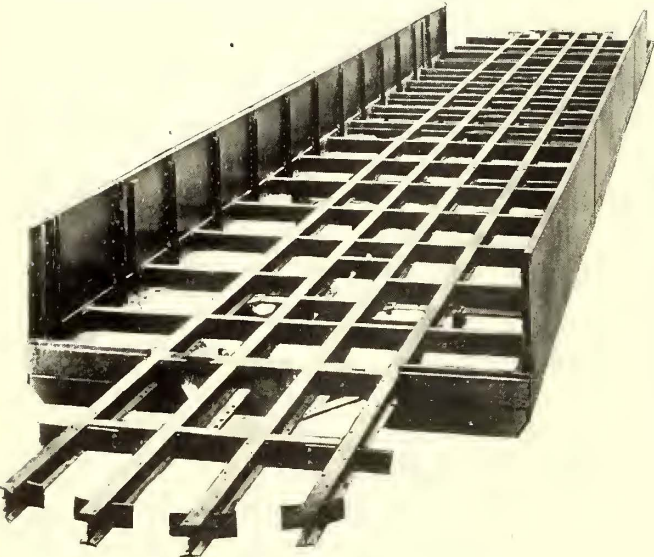
The new rolling stock of the company, purchased particularly for use on the Bluemont division, consists of ten passenger motor cars, six passenger trailers and two freight motor cars. Of the first ten cars mentioned six are straight passenger with smoking compartment and four are combination passenger and baggage cars, with mail-handling furniture so arranged that it can be readily installed or removed and the compartment changed from ordinary baggage to a United States railway post office. All ten cars are 50 ft. long over bumpers, 8 ft. 6½ in. wide over sheathing and 9 ft. high from bottom of sill to top of roof. They are of composite steel and wood construction but built somewhat differently from the usual mixture of steel and wood so often found in an interurban car body. The side girders and underframing are almost entirely of steel, while the superstructure and interior finish are of wood.

The load-carrying parts of the car framing comprise the side girders, the longitudinal sills, the needle beams, bolsters and cross sills. These are all of steel without wooden fillers or reinforcement. The side girder consists of a 30-in. plate girder, whose bottom flange is a 6-in. x 6-in. side-sill angle and whose top flange is a belt-rail angle about 1½ in. x 2 in. The web is of 3/16-in. steel plate, there being three sections of it, butt-strapped together, in its total length of 39 ft. These are the main load-carrying members of the car. The center and intermediate sills are continuous be-

tween buffers and are of 6-in. I-beams. The floor load is transferred to the side girders through steel needle beams, steel angle cross-sills at the ends of the body framing and bolsters of the usual built-up steel type. The cross-blocking or bridging pieces in the floor structure are of oak, fitted into pockets formed against the sides of the longitudinal sills by iron angles riveted thereto. This cross-blocking is at no time in tension but is held in compression by one turn-buckle rod at each crossing, reaching across the car from girder to girder, its prime function being the foundation for the car floor. It is, therefore, unnecessary to provide longitudinal railing strips or fillers in the sills, and the weight of a large amount of timber, entirely useless except for railing strips, is eliminated. The absence of fillers, besides saving in weight, was found to facilitate the work of installing the car equipment. The floor was further stiffened by diagonal bracing of flat steel placed between the bolsters and the needle beams.

The platform buffer timbers are of oak, finished off with Hedley anti-climbers and reinforced with oak blocking.

The side girders are stiffened on the inside with vertical angles, so arranged as to form side-post pockets, into which are fitted side posts of ash, spaced 2 ft. 8 in. between cen-



Washington & Old Dominion Railway—Floor and Part of Side Framing of Composite Steel and Wood Car

ters. The car body and vestibule and posts are of oak and the side plates that rest upon them are of yellow pine. The roof is of the single-arch type, with eight Globe ventilators per car. The interior headlining is of agasote, painted light green with plain gold striping. The interior finish of the sides and ends of the car, doors, sash and partitions is of cherry.

The cars are full-vestibuled, and for convenience in train operation end doors are provided in the vestibules.

The straight passenger cars were each fitted with two toilets, and the combination cars and trailers with one each. The partitions between compartments are glazed so that the conductor has a full view of the car from either end. The seats are of Hale & Kilburn make, with pressed-steel arm rests. They are upholstered in Spanish leather in the main compartments, with rattan in the smoking compartments. With the steel side girder construction adopted the thickness of the side walls of the car is only about 2 in. instead of 4 in. or 5 in., as would have been the case with wooden side-truss construction. Consequently it was possible to use a seat cushion 39 in. long and still have a center aisle 20½ in. wide.

The baggage and mail compartments were so designed as to enable conformity to the government requirement that the mail clerk be completely isolated from train crew and

passengers. The motorman's cab in that end of the car, and the 5-ft. baggage side door on that side are so arranged that the cab, when opened out for use, can be entered through the smaller swinging section of the side door, while the larger or sliding section of the side door still gives ample service to that side of the compartment. The motorman is thus separated by his folding partition from the mail compartment and at the same time has ingress and egress independent of it.

The mail furniture in the compartment is made in accordance with dimensions specified by the United States Post Office Department and is readily removable, so that the car can be easily changed from mail to baggage service or vice versa.

To supplant the regular baggage service and to provide general express, light freight and milk transportation there are provided two freight motor cars. These are built entirely of wood, excepting the center sills. They are 41 ft. long over all, 9 ft. wide inside and 10 ft. from bottom of sill to top of roof, with cab in each end.

All motor cars are equipped with four No. 306 Westinghouse motors and Type HL multiple-unit control. The motors are of 60 hp at 600 volts and have sufficient capacity to maintain a schedule speed of 25 m.p.h. with stops averaging 2 miles apart, or 30 m.p.h. with stops 4 miles apart. While this is lighter equipment than has been usual for interurban service, the cars weigh equipped less than 30 tons, the schedule speed is moderate and the stops are not very frequent.

It is intended that the combination cars and freight cars shall haul trailers when required. Consequently the motor gearing is different from that on the passenger cars, 15:69 for the former and 22:62 for the latter.

There are six passenger trailer cars built like the motor cars in all respects except that they are 8 ft. shorter, have open platforms with gates but without vestibules, only one toilet and rattan seats. Connectors are provided on the trailer cars to receive heat and light current from the motor cars.

The cars are fitted with type A.M.S. Westinghouse automatic brakes, Consolidated Car Heating Company's electric heaters and General Electric Company's Form D luminous arc headlights.

The trucks are all of the Standard Motor Truck Company's C-50-P pressed-steel frames with 4¼-in. x 8-in. journals, 5-in. axles and M.C.B. 36-in. rolled-plate wheels and a wheelbase of 6 ft. 4 in.

The car bodies were built by the Southern Car Company, of High Point, N. C., at whose works the electrical equipment was mounted and connected up. The bodies so equipped were mounted upon their trucks by the railroad company after being received from the manufacturers.

DISPATCHING

The usual telegraphic train-order dispatching system has been used for handling the electric trains in the same way as with steam power, but it is being supplemented by a telephonic dispatching system now being installed by the Western Electric Company which consists of its latest type of selective apparatus working over two telephone wires. This will enable the dispatcher to call up any agent and transmit train orders or, at stations where there are no agents, to set a semaphore against a train that will stop it for orders, a telephone booth being installed at every such semaphore. At the outset there will be about twenty-one telephone instruments. The telephone wires are run on the same cross-arms as the low-tension feeder.

RECORDS OF CONSTRUCTION WORK

Work on the 3-mile cut-off was begun early in the fall of 1911. In January, 1912, the engineering work involved in the selection and purchase of the equipment was undertaken. Choice was made and contracts for material and apparatus were let in March. The 3-mile cut-off was completed ready for train service so that the first elec-

tric train ran over it on June 30, and on July 1 the lease of the Bluemont line from the Southern Railroad went into effect. Steam operation was continued between Alexandria and Bluemont, but electric service was started on that date between Washington and Bluemont Junction, passengers changing between the steam and electric cars until about Oct. 6, when electric service was extended to Leesburg and in December to Bluemont.

The entire work was planned and carried out under the personal direction of W. B. Emmert, general manager. The surveys, location and construction of the cut-off, the design and construction of the overhead lines, the substation buildings and the installation of the substation equipment, the signal system, etc., were in charge of O. H. Bundy, chief engineer, who on Sept. 1 was also placed in direct charge of engineering construction, maintenance of roadway and structures, maintenance and operation of power plant, overhead lines, substations and electrical equipment.

The equipment engineering, covering the selection of the system, plans and specifications for power station improvements, substation apparatus and car bodies, trucks and car equipment and the supervision of power house and car construction, in collaboration with the chief engineer, was in charge of the writer of this article in the capacity of consulting engineer.

HEARING ON RULES FOR INTERLOCKING PLANTS IN INDIANA, ILLINOIS, WISCONSIN AND MINNESOTA

The engineers for the Railroad Commissions of Indiana, Illinois, Wisconsin and Minnesota have drafted a set of rules and regulations to govern the construction, reconstruction, maintenance and operation of interlocking plants in these States. The signal engineers of the roads affected were invited to attend a preliminary hearing at Springfield, Ill., a short time ago. At the conclusion of this hearing the engineers requested more time to study the rules and appointed a committee to consider all the requirements.

On March 12 a second hearing was held at the offices of the Railroad & Warehouse Commission in Chicago. This hearing was also attended by the members of the signal committee of the Illinois Electric Railways Association. Objections were raised in regard to the design, maintenance and operation of interlocking plants as specified by the commissions' engineers in their relation to both steam and electric roads. Besides being required to conform to all the rules to which objections were raised it is proposed to require the electric railways to provide suitable guards on their trolley wires to prevent the trolley from leaving the wire at crossings.

John Leisenring, signal engineer Illinois Traction System, Peoria, said that this special provision was a burden upon the electric railways and was not in conformity with modern overhead trolley construction. It increased the strains on the overhead work at the crossings. The accumulation of sleet on this wide guard area in special instances would be so great that it would be almost impossible to maintain the line properly under the ordinary methods of construction.

The purpose of the interlocking plant was to protect the crossing and it appeared unreasonable to require the electric railways to take an additional precaution which at times might cause more delay than the remote one of having to replace the trolley wheel on the wire. The best modern overhead construction, as approved by the joint committee drafting specifications for overhead line crossings, required the simplest construction arrangement.

The engineers for the commissions have taken the question under advisement and will redraft this clause along with others which were opposed. They will then submit the revised rules at a future and final hearing.

EQUIPMENT TRUSTS FOR ELECTRIC RAILWAYS

Since the publication in the *ELECTRIC RAILWAY JOURNAL* (July 8, 1911) of W. B. Brockway's admirable article on "Equipment Trust Securities" as applied to the financing of electrical railways there has been a steady increase of interest in this method of providing for additions to rolling stock.

The following list of equipment issues made by electric railways is probably incomplete, but it is as comprehensive as it could be made in view of the fact that such issues are not recorded with the care and attention that are given by bankers to steam railroad issues of the same description. It is not improbable, however, that with the increase that now appears likely in the volume of such securities the financial markets will soon have to take more serious account of them.

ELECTRIC RAILWAY EQUIPMENT TRUSTS

Fort Wayne & Wabash Valley Traction Company.....	\$85,000
Indianapolis Traction & Terminal Company.....	300,000
Northwestern Electric Railway of Chicago.....	185,000
Chicago & Oak Park Elevated Railroad Company.....	217,000
United Railways & Electric Company, of Baltimore.....	1,590,000
Public Service Railway of New Jersey.....	1,700,000
Coney Island & Brooklyn Railroad.....	30,000
Pittsburgh Railways.....	400,000
Norfolk & Portsmouth Traction Company.....	25,000
International Traction Company.....	850,000
Virginia Railway & Power Company.....	25,000
United Railway of San Francisco.....	350,000
Philadelphia Rapid Transit Company.....	1,500,000
Market Street Elevated Passenger Railway.....	325,000
Hudson & Manhattan Railroad.....	2,414,500

All of these issues are not outstanding, and in the case of the United Railways & Electric Company of Baltimore the unpaid portions of its B and C equipment issues, originally amounting to \$1,240,000, were redeemed with three-year 5 per cent collateral trust convertible notes. This action was taken under a redemption clause, not unprecedented but somewhat unusual in car trust agreements, which provided that the railway company might at any time anticipate the payment of any or all of the outstanding certificates upon any instalment date by giving thirty days' notice of its intention so to do and paying a premium of 2½ per cent upon the face value of the certificates so taken up.

CLASSES OF EQUIPMENT ISSUES

As a rule the provisions of equipment trust agreements follow essentially the outline given by Mr. Brockway in the article already referred to, but the obligations may be divided as to details into three general classes in the following way:

First—Where the bond is a direct obligation of the railroad, being secured by pledge upon the equipment purchased by the trustee and by it sold or leased conditionally to the railroad. In such cases the railroad is liable for any deficiency that might exist should the sale of the equipment itself be found insufficient to cover principal and interest of the securities issued. This is a very simple contract which binds the railroad to protect the equipment obligations at all hazards.

Second—Where an association is formed to purchase the rolling stock and leases it to the road, which ultimately becomes owner after the full purchase price has been paid. The contract embodying these provisions is then deposited with a trust company, as trustee, which issues certificates based thereon. Under these conditions the equipment may be leased or sold, and in the event of default the railroad must make good any deficiency.

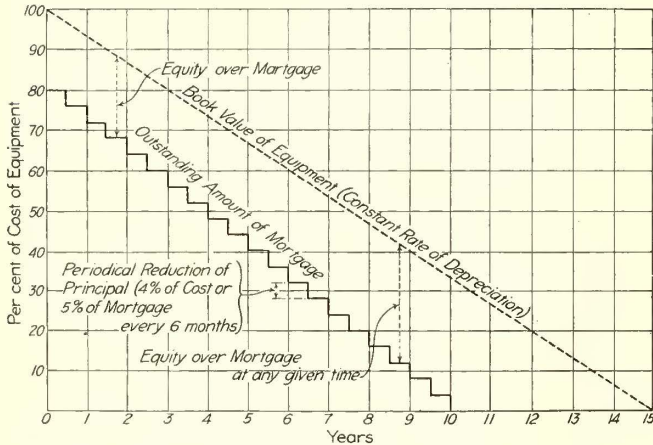
Third—An association is formed to lease or to sell conditionally the equipment to the railroad company. The association then sells shares of its own capital stock to the public. These certificates, although not direct obligations of the railroad, are guaranteed by it and to all intents and purposes offer the same protection. The guarantee makes the railroad specifically liable in case of default in principal or interest.

COMPANY FORMED TO FINANCE ELECTRIC EQUIPMENT PURCHASES

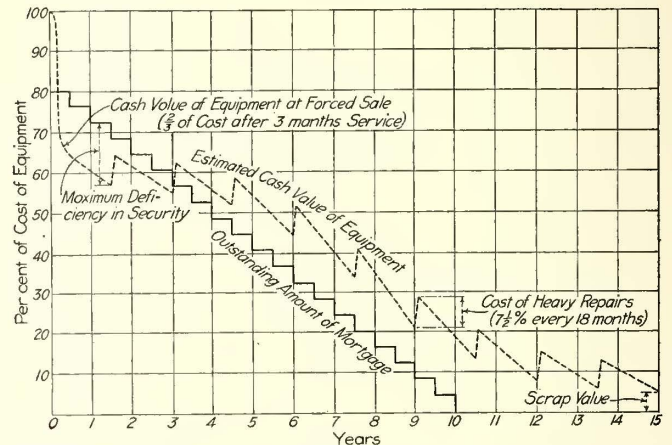
Quite lately a company has been formed in Philadelphia especially to handle electric railway equipment issues. According to this company's plan of operation it will, before undertaking the purchase of an issue of car trust certificates, require a satisfactory statement of the earnings and resources of the railway company, obtaining evidence that the purchase of new cars is warranted and that the railway company is in a position to provide for their maintenance. The securities company will also have a voice as to the specifications of the cars to be bought. These preliminaries being settled, the company will create car trust certificates to the amount of about 75 per cent of the cost of the cars to be financed, the railway company paying down the differ-

holders of equipment obligations have been protected, even as against the holders of first mortgage bonds. In a decision of the United States Circuit Court in the case of the Denver & Rio Grande Railway equipment bonds, after the reorganization of 1886, the court ruled that equipment obligations constituted really preferred claims, and that they ought to rank ahead of the mortgage claims, being paid out of revenues the same as wages. The effect of this decision was actually to place these obligations ahead of the first mortgage bonds.

As long ago as July, 1898, the STREET RAILWAY JOURNAL printed a note to the effect that Messrs. Tate & Jones, of Pittsburgh, "have made an arrangement with trust companies whereby they are enabled to extend to electric railways the service of a car trust in financing the purchase of



Equipment Trusts—Security Given to 80 Per Cent Mortgage. Based on Book Value of Equipment



Equipment Trusts—Security Given to 80 Per Cent Mortgage. Based on Probable Cash Value of Equipment

ence between the amount of the certificates and the cost of the equipment to be bought. The remainder is distributed in semi-annual instalments over a period of ten years, together with interest also payable semi-annually on the outstanding certificates, which are guaranteed by the railway company. The title to the entire number of cars against which certificates are issued remains in the hands of the trustee until all instalments are paid in full. It is evident that this plan overcomes the difficulty heretofore experienced by electric railways in obtaining a market for small amounts of equipment notes, the company referred to being constantly in the market for such issues, which it plans to deposit with a trustee and then to issue and sell to investors its own serial bonds.

ESSENTIALS OF EQUIPMENT ISSUES

The diagrams herewith presented show the characteristics of equipment issues, from the viewpoint of railway, banker and investor, and the working out of a typical car trust. The investor, of course, must be satisfied that an equipment note affords good security or there will be no receptive market for such issues and their volume will be correspondingly small. It is therefore necessary that the cost of the equipment shall be sufficiently in excess of the original amount of the mortgage to insure the investor an ample margin of security at all times during the life of the car trust, the earlier as well as the later years of its term. One of the diagrams herewith shows that the security may under some conditions be insufficient during the first years of the trust.

There is hardly any investment, however, which has a better record for safety than the equipment issues of steam railroads, and electric railway car notes are of course essentially the same in nature and security. The equipment issue has always been placed in the category of preferred claims by the courts, decisions to this effect being based usually on the theory that equipment is essential to the life of a transportation company. On this theory the

rolling stock." This was fourteen years ago, and the slow progress of equipment trust financing since then is due, no doubt, not to any essential difference between electric railway and steam railway equipment bonds, but to the difficulty of interesting bankers in small issues. If this difficulty has now been removed, the electric railway equipment trust certificate may be expected to be found in largely increased amounts in the investment market with great advantage to the electric railways of the country.

MILEAGE MAINTENANCE SYSTEM ON THE SYRACUSE LINES, NEW YORK STATE RAILWAYS

The lines of the New York State Railways in the city of Syracuse have recently introduced a mileage maintenance system. This has been adopted with the expectation that the procedure of making inspections and applying lubrication upon a strict mileage basis will effect improved economy and in addition will add to the reliability of the rolling

MILEAGE MAINTENANCE SYSTEM, NEW YORK STATE RAILWAYS, SYRACUSE LINES

Part Inspected	INSPECTION Mileage	Class of Equipment
Air brakes	1200	All cars
Controller	600	All cars
Journals	3000	All cars
General	300	St. Louis
General	600	All others
Gears	1200	All cars

Part Lubricated	LUBRICATION Mileage	Class of Equipment
Motors	300	GE-54
Motors	600	GE-67
Motors	2500	GE-216
Motors	300	GE-1000
Motors	2000	West. 101
Gears	8000	All types

All journals, axles and armature bearings are repacked every 25,000 miles.

stock. The accompanying table shows the mileages which have been adopted as standard between inspections of the different parts of the equipment as well as for the lubrication of the various classes of motors and of gears.

Convention of the American Railway Engineering Association

Many Subjects of Interest to Electric Railways Were Considered by This Association at Chicago—Those of Special Importance Include Effect of Metal and Treated Ties on Signal Operation, Specifications for Track Fastenings, for Rail Composition, for Metal, Composite and Concrete Ties and for Fence Material—An Account of the Proceedings Is Also Given

The fourteenth annual convention of the American Railway Engineering Association was held in Chicago March 18 to 21. From March 15 to March 21 the National Railway Appliances Association gave its annual exhibition in the Coliseum and the First Regiment Armory.

Conforming to the established custom, the proceedings of the association included reports from twenty-one standing committees and also several papers describing the results of special tests to determine the efficiency of various materials and construction methods. As the long life of this association has enabled it to prepare numerous standard specifications, the work of the different committees during the past year was largely confined to collecting data with a view to the improvement of the quality of standard railway materials as well as the methods employed in their manufacture and application. Some changes were recommended in the specifications for carbon steel rails and additional instructions were drafted governing maintenance-of-way employees. One of the most important recommended additions to the manual of this association was a complete set of specifications governing the design and manufacture of track fastenings and their accessories.

RAIL COMMITTEE REPORT

Briefly, the report of the rail committee included some unimportant revisions of the specifications for carbon steel rails, statistics of rail failures and conclusions drawn therefrom and detailed reports of special investigations of rails. M. H. Wickhorst, engineer of tests for the committee, reported on the following subjects: abrasion tests of rails on revolving machine, influence of titanium on Bessemer ingots and rails, pipeless ingots, transverse ductility of base of rail, influence of silicon on open-hearth ingots and rails. In addition to the work of the engineer of tests the report of this committee contains the results of investigations on the effect of transverse or internal fissures in rails, method of producing sound ingots, new method of revealing segregation in steel ingots and the results of stremmatograph tests of track under service conditions.

RULES AND ORGANIZATION

In accordance with instructions the committee on rules and organization recommended that a number of rules be added to the "Instructions" which were presented and adopted by the association at its convention of last year. Among them were the following:

"27. Tie plates must be used wherever ties wear out faster than they fail by ordinary decay. They must be put on so as to get a full and level bearing on the tie and against the rail.

"29. The standard gage is 4 ft. 8½ in. Curves 8 deg. and under should be standard gage. Gage should be widened ⅓ in. for each 2 deg. or fraction thereof, 8 deg. to a maximum of 4 ft. 9¼ in. for tracks of standard gage. Gage, including widening due to wear, should never exceed 4 ft. 9¼ in.

"30. The installation of frogs upon the inside of curves is to be avoided wherever practicable; where this is unavoidable the gage of the track at the frog should be standard.

"35. Switch points must fit closely and accurately to the stock rail, which must be bent to suit the angle of the switch. The bend in the stock rail shall be at such dis-

tance ahead of the switch point as will make the gage line continuous.

"37. All main track switches leading to sidings or branch lines should be protected by switch-connected details.

"38. Switch ties must be used for all permanent turnouts, cross-overs and railroad crossings and placed as shown on the standard plans.

"39. Frogs must be protected by guard rails, constructed and placed in accordance with standard plans. The tops of the guard rails must be level with the tops of the main rails and must be securely held in place.

"40. Guard rails must be so placed that the distance from the gage side of the head of the frog wing rail to the flange-way side of the guard rail shall be exactly 4 ft. 6¾ in., and great care must be taken to preserve this distance.

"43. Tools must not be left standing within 6 ft. of the nearest rail of the track on which a train is approaching.

"50. Cattle guards must be kept in regular repair and at all times free from dirt, rubbish and other obstructions.

"51. Track jacks must not be used between the rails of main tracks, except in unavoidable cases; the track must then be properly protected as with other obstructions.

"53. The track must never be obstructed without first displaying stop signals not less than twenty telegraph poles in each direction from the point of obstruction. Stop signals must be in the hands of reliable men. Flagmen must stop all trains and explain to the engineman the nature of the obstruction and its exact location.

"57. Except in case of emergency, no work that will obstruct the track shall be done during fogs or storms.

"60. In using signals on double track, each track must be considered as a single-track railroad upon which trains are likely to be run in either direction at any time.

"61. Care must be exercised by foremen and other employees in the use of hand, push, motor and velocipede cars. In order to avoid accident, they must protect themselves with the proper signals when the view is obstructed. On moving hand cars at least one man must face the rear to look out for approaching trains.

"63. Hand cars must never be used or left on the main tracks or sidings unprotected. Loaded hand or push cars on the track are obstructions and must be protected by the proper signals.

"64. Hand cars must not be attached to trains. When following trains or other moving cars they must not run closer than ten rail lengths.

"66. Switches must not be thrown for such cars, unless loaded, and then only under the supervision of the foreman."

SIGNALS AND INTERLOCKING

On the subject of the effect of treated and metal ties on track circuits, the committee on signals and interlocking submitted a report which is given in part as follows:

"The effect of metal ties is self-evident. Each rail must be completely insulated from its ties to prevent a short-circuit (similar to the action of the wheels and axle of a train). Defective insulation at any point will cause leakage and defective insulation at both ends of only one tie will throw the track circuit out of service. The effect of creosoted ties is not serious and, with alternating-current track circuits, is negligible. The effect of zinc-treated ties is more problematical.

"In response to a circular sent to all members, 126 replies were received, representing ninety-two railroads—many of them trunk lines. Sixty-nine of these use no zinc-treated ties; four use them to such a limited extent as to render a report valueless, including two which are making the first installation this year; seven use them extensively but not where track circuits are in service; only twelve use them with track circuits, showing that while the subject is decidedly important to these roads, it does not at the present time, in view of this small percentage, appear to be of great general interest, although if it could be shown that this treatment did not affect circuits seriously, its use might be extended.

"The consensus of opinion, based upon the experiences of the roads using track circuits, is:

"(1) That track circuits a mile in length are rendered inoperative by the extensive use of zinc-treated ties.

"(2) That track circuits 2000 ft. in length may be operated successfully even with 50 per cent or more of ties so treated.

"(3) That 10 per cent to 15 per cent renewals a year will not materially affect such length circuits.

"(4) That where renewals are made of fifteen or twenty adjacent ties the leakage is much greater than where they are made singly at uniform distances, i. e., with 15 per cent renewals (every sixth or seventh tie).

"(5) That while the surface salts are present more leakage occurs during wet weather than with untreated ties, as these wet salts form a better conductor than ordinary wet wood.

"(6) That in dry, hot weather the salts are drawn to the surface and constitute a more or less perfect conductor.

"(7) That after a period varying from three months to a year these salts disappear and subsequently no interference is noticeable."

TRACK COMMITTEE REPORT

The report of the committee on track contained a set of general specifications to be followed in the design and manufacture of tie plates, track bolts and anti-creepers. Under these heads the following detailed specifications were drafted: steel tie plates, malleable tie plates, wrought-iron tie plates, track bolts, spiral spring lock, ordinary track spikes and screw spikes. Under the subject of general principles to be followed in the design of tie plates, the following outline was recommended:

GENERAL PRINCIPLES TO BE FOLLOWED IN THE DESIGN OF TIE PLATES

The plates shall not be less than 6 in. in width and as much wider as consistent with the class of ties to be used.

The length of the plates shall be not less than the safe bearing area of the ties divided by the width of the plate and when made for screw spikes shall be so shaped as to provide proper support for the screw spikes.

They shall be not less than 5/8 in. thick along either edge of the base of the rail.

The thickness of the plate shall be properly proportioned to the length. The plates shall have a shoulder at least 1/2 in. high. The distance from the edge of rail base to the end of the tie plate on the outer side must be uniform and in excess of the projection inside of the rail base.

Where treated ties are used or where plates are for screw spikes a flat bottom plate is preferable. Where ribs of any kind are used on base of plate these shall be few in number and not to exceed 1/4 in. in depth.

The punching must correspond to the slotting in the splice bars and where advisable, may be so arranged that the plates may be used for joints. Spike holes may be punched for varying widths of rail base where the slotting will permit such punching without the holes interfering with each other and when the plate is of such design that the additional holes will not impair the strength of the plate.

WOODEN BRIDGES AND TRESTLES

The report of the committee on wooden bridges and trestles contains conclusions as to the use of guard rails for wooden bridges and trestles. These conclusions follow:

RECOMMENDATIONS FOR THE USE OF GUARD RAILS AND TIMBERS

1. It is recommended as good practice to use guard timbers on all open-floor bridges, and same should be so constructed as properly to space the ties and hold them securely in their places.

2. It is recommended as good practice to use guard rails to extend beyond the ends of the bridges for such a distance as required by local conditions, but that this length in any case be not less than 50 ft.; that guard rails be fully spiked to every tie and spliced at every joint, the guard rail to be some form of a metal guard rail.

3. It is recommended that the guard timber and guard rail be so spaced in reference to the track rail that a derailed truck will strike the guard rail without striking the guard timber.

4. The height of the guard rail to be not over 1 in. less than the running rail.

SIGNS, FENCES AND CROSSINGS

As a result of correspondence with a number of roads in the United States, as well as with the manufacturers of the material, the committee on signs, fences and crossings made a report on the different kinds of fence posts in part as follows:

"There are certain species of woods that are not suitable for fence posts but which doubtless must be used because they are cheap and native to the locality. In reviewing the replies of the various roads it was found that the consensus of opinion, based upon the experience of the users, is that the different classes of timber have an average life as indicated below:

	Years		Years
Red cedar.....	18	White oak.....	10
White cedar.....	15	Bois d'arc.....	25
Chestnut.....	12	Catalpa.....	15
Yellow locust.....	20	Juniper.....	15
Black locust.....	20	Mulberry.....	15

"Climatic influences have an important bearing upon this phase of the case and may lengthen or shorten the life of a particular kind of wood, dependent upon the locality in which it is used. It is not feasible in most cases to recommend any particular kind of timber for a given territory, as the source of supply may be so distant as to preclude its use economically. It is the prevailing practice to use such timber as is native to the country and thus most easily obtainable. According to information received, the cost of the various kinds of wood posts is:

	Range, Cents	Average, Cents
Red cedar.....	15 to 25	22
Cedar.....	7 to 20	14
White cedar.....	12 to 15	14
Chestnut.....	10 to 27	20
Locust.....	15 to 40	25
Yellow locust.....	20 to 38	30
Black locust.....	15 to 25	20
White oak.....	11 to 40	20
Bois d'arc.....	13 to 17	15
Catalpa.....	15 to 25	20
Juniper.....	6 to 10	8
Mulberry.....	13 to 17	15

"It will be observed that the relative cost to life of post ranges from 1/2 cent to 2 cents per year of life, the bois d'arc and the juniper being the cheapest posts, but so rare that a more general use is impossible."

CONCRETE FENCE POSTS

Under the subject of concrete fence posts, the committee compiled considerable information concerning the design and methods of manufacture of eleven different types ranging in price from 12.8 cents to 25 cents per post, and as the result of this investigation the following conclusions were drawn:

RECOMMENDATIONS FOR THE CONSTRUCTION OF CONCRETE FENCE POSTS

1. Concrete posts are practical, economical and a suitable substitute for wood.
2. Reinforcement should be placed as near to surface of post as possible; 1/2 in. from surface is best location.
3. Post should taper from base to top.
4. Post should not be less than 5 1/2 in. at base and 4 in. at top.
5. Concrete mixture should consist of one part cement to four of run of pit gravel, or one part cement, two parts sand and four parts crushed rock or screened gravel. Gravel or crushed rock not to be smaller than 1/4 in. in size nor larger than 1/2 in. Concrete should be of a quaking consistency.
6. Molds should have a jogger or vibratory motion while concrete is being introduced to compact it and smooth up surface of post.
7. Posts should not be made out of doors in freezing weather. They should not be exposed to sun and should be sprinkled with water the first eight or ten days after being made to aid curing.
8. Molds should be carefully oiled or soaped to provide a smooth finish and to prevent concrete sticking to mold.
9. Posts should be cured for not less than ninety days before being set or shipped.
10. Posts should be carefully handled and be packed in straw, sawdust or other suitable material for shipment.

TIES

The report of the committee on ties stated that an exhaustive study of stresses in cross ties had been made covering a period of two years and that the committee had come to the conclusion that experiments to determine the size of cross ties were impracticable.

The committee was unable to obtain any definite information bearing on the relative effect of the different designs

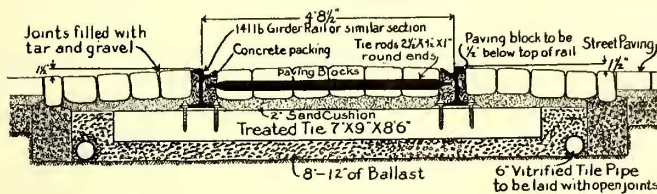
of tie plates and spikes on the life of ties. It was thought that the experiments which were being conducted would throw some light on this subject in the near future and permit definite recommendations to be made.

TRACK CONSTRUCTION AND FLANGEWAYS AT PAVED STREET CROSSINGS AND IN PAVED STREETS

Specifications for the best form of track construction and flangeways at paved street crossings and in paved streets were submitted. They stated that treated ties should be used and should be laid on a bed of crushed rock, gravel or other suitable material, not less than 8 in. nor more than 12 in. in depth, placed in about 3-in. layers, each to be thoroughly rammed to compact it.

Vitrified tile drains were recommended to be not less than 6 in. in diameter, with open joints and leading to nearest point from which efficient drainage might be obtained or with sufficient outlets to reach sewers or drainage basins. These should be laid on either side of and between tracks, parallel with ballast line and outside of ties.

It was recommended that a 141-lb. girder rail of 9-in. depth or one of similar section, with suitable tie plates and



Recommended Track Construction for Steam Railroads at Paved Street Crossings

screw spikes, should be used. The track should be filled in with crushed rock, gravel or other suitable material, allowing for a 2-in. cushion of sand to support the finished pavement.

Ballast for paving foundation should be well rammed as it is installed. Two inches of good sharp sand should be placed on top of the ballast. Paving should conform with municipal requirements, granite or trap rock blocks preferred. Hot tar and gravel should be poured into joints as a binder.

The accompanying illustration shows the recommended arrangement.

INVESTIGATION OF MEANS FOR OBTAINING NON-CORROSIVE FENCE WIRE

The committee reported that it had endeavored to obtain all available information as to the most recent practice in the matter of non-corrosive fence wire but that developments had been very few. It had investigated several foreign operations in the hope that they would indicate progress in the matter, but thus far these operations had not been applied to any large extent in the manufacture of fencing wire.

It was the opinion of one of the large manufacturers that the most practical solution of the problem of securing greater durability was what was known as the "special galvanizing" process. The fence was made from wiped wire which would withstand four one-minute immersions in the standard copper sulphate solution for both the horizontals and stays.

It was asserted that such a galvanized wire should compare favorably with unwiped wire which would pass the same test. The committee thought, however, that this was open to question, although it was understood that large tonnages of this special galvanized wire were being supplied according to specifications prepared by foreign railway companies.

It was the impression that the English railway companies were not satisfied with wire supplied by the United States manufacturers, and in taking the matter up with the latter it was learned that one of them was compelled to install

such machinery in England that the fabric might be made of English wire in order to satisfy the trade of the United Kingdom.

It was also stated that English galvanizing was greatly superior to that of this country and that it was very largely done by the cold process of what was termed "electro-galvanizing." So far as could be learned, no machinery or process had been developed in this country for that purpose that had proved satisfactory.

It was claimed that during several years past more attention had been given here to the proper cleaning of the zinc before it was introduced into the zinc bath and that the spelter had been more carefully scrutinized. One of the Canadian railroads in its specifications called for a superior galvanized stock, which was run without wiping and lifted from the spelter bath at an angle of about 90 deg., being drawn through a charcoal flux on top of the bath, instead of being pulled through asbestos wipers as in ordinary practice.

This process permitted the maximum amount of spelter to cool upon the wire and at the same time prevented it from gathering in globules on the bottom of the strand, distributing it evenly over the surface in a smooth, heavy coating. It was claimed that cracking or peeling of the coating in the process of fabrication was very infrequent. It was also stated to be desirable to make further study of the influence exercised by the character of the underlying metal.

In the 1911 report reference was made to a test on fence material that was being conducted by a certain railroad, commenced on April 1, 1909. An up-to-date report on this as of Nov. 14, 1912, was given as follows:

- TEST A.—Galvanized after weaving: This was found to be in perfect condition, with no indication of rust anywhere.
- TEST B.—Ordinary dip process: The corrosion in this fence had been rapid during the past year; the galvanized coating had entirely disappeared and the entire section of fence was covered by red rust.
- TEST C.—Special galvanized: This was found to be in excellent condition; no corrosion was apparent.
- TEST D.—Sherardized: This showed corrosion in an advanced stage; the preventive of rust infusion had largely disappeared.

The conclusion was that the last-named method of treating wire as a rust preventive had proved less satisfactory than any of the others. The advanced stage of corrosion in this fence was about the same as that of Test B. It may be said, however, that there were no means of knowing that the sample fence was sherardized in the best manner, as the best facilities for sherardizing could not be obtained at that time. It was possible, therefore, that more perfect sherardizing would give better results.

REPORT OF COMMITTEE ON BALLAST

The report of the committee on ballast included a proposed test to determine the proper depth of ballast of various kinds to insure uniform distribution of loads on the roadway. The test as outlined is given in part in the following recapitulation:

TEST FOR DETERMINATION OF PROPER DEPTH OF BALLAST

1. Select a stretch of track on clay roadbed, under heavy traffic, where trouble has been experienced with clay working up between the ties.
2. Excavate roadbed to a uniform depth of 30 in. below the bottom of the ties for a space of two rail lengths; prepare the adjacent rail lengths in the same manner, decreasing the depth 3 in. under each successive two rails until the bed is 12 in. below the bottom of the tie (14 rail lengths).
3. Place on this bed a thin layer of fibrous material, such as hay, to make a well-defined separation between roadbed and ballast.
4. Place stone ballast on bed to the above-mentioned depths, tamp well and put track in good line and surface.
5. Make note of tie spacing, width of ties, keep accurate levels and record of amount of time spent on surfacing various parts of track, also keep record of axle loads and amount of traffic. Take photographs at regular intervals to show deformation of roadbed.
6. Make similar test for gravel and similar for ballast section, having a sub-ballast of gravel equal to one-half the total depth and a top ballast of stone equal to one-half the total depth of ballast.
7. The estimated cost of this test is as follows:

(a) Cost of material (stone), 500 yd., at 80 cents.....	\$400
(b) Labor preparing track and widening bank, where necessary, at \$30 per rail (fourteen rails per test).....	420
(c) Labor, inspecting, six inspections at \$2 per rail.....	120
(d) Line and surface to be paid for by railway owning track, at regular maintenance charge.....	00
Total for one test.....	\$960
Three tests.....	3,000

A compilation which was made to determine the physical properties of gravel ballast was based on samples from nineteen different roads in as many different localities in the United States. The results showed that the weight of gravel per cubic yard, as received, varied from a minimum of 2543 lb. to a maximum of 3411 lb., and the material, after being dried, varied from a minimum of 2532 lb. to a maximum of 3403 lb. The percentage of moisture varied from a minimum of 0.23 per cent to a maximum of 1.60 per cent; the percentage of gravel varied from a minimum of 19 per cent to a maximum of 94 per cent; the sand varied from a minimum of 5.3 per cent to a maximum of 61.8 per cent, and the dust from a minimum of 0.7 per cent to a maximum of 22.1 per cent.

Another test which may be of interest to electric roads was one on cleaning stone ballast by the use of screens. The results of this test tended to show that a gang of twelve men, properly equipped with tools, would cover about 165 ft. of double track per day of ten hours, making the cost per mile of double track \$640. This cost included the work of cleaning the ballast, dressing the track and disposing of the dirt. The labor charge included a foreman at \$2.40 and eleven laborers at \$1.60 each.

The report of the committee on buildings included detailed descriptions of various roofing materials and was accompanied by a specification considered as good practice for felt, pitch and gravel or slag roofing over boards. A brief report on the advantages and disadvantages of various types of freight house floor construction was also included. This is given in part as follows:

FREIGHT HOUSE FLOORS

"Freight house floors should ordinarily be built to carry a uniformly distributed load of at least 250 lb. per sq. ft. Except for small houses, a filled-in floor, considering the cost of maintenance, is ordinarily cheaper than joist construction. It is also advantageous, because it will carry the unusually heavy loads that sometimes occur.

"The usual method of construction consists of filling up to the required level with sand or gravel, thoroughly flushed and compacted. To insure a dry floor, on this filling is laid a bed of cinders about 6 in. thick, thoroughly compacted. In the cinders are bedded sleepers, preferably about 4 in. x 6 in., laid flat, about 2-ft. 6-in. centers. These and the plank above them should be thoroughly treated with creosote of zinc chloride where there is to be an additional wearing surface applied. With untreated timber renewal is sometimes necessary within four years, though under favorable conditions a life considerably greater is usually obtained. When no cinders are used on top of the sand the decay seems to be hastened.

"In place of cinder filling and sleepers a layer of coal-tar pitch spread upon a layer of sand over a course of concrete is being quite extensively used. This is durable and is said to give good results. Specifications for this method are obtainable from the coal-tar producers.

"Either on the sleepers, laid in cinders, or on the pitch are laid planks about 2 in. thick. With the pitch sub-floor the plank should be laid with broken joints toenailed and embedded in the pitch by hammering until the proper stability is obtained. Care should be taken to see that they are brought to an exact grade. The plank need not necessarily be toenailed with the wooden sleepers.

"To get a smooth-wearing surface on top of the plank hard maple is generally preferable. It does not splinter and it wears evenly. It has a short life when exposed to the weather. It is growing scarce and getting expensive. Beech is often sold for maple, they being difficult to distinguish. It is somewhat darker in color and it splinters more. Birch is softer than beech or hard maple but does not splinter so readily as beech.

"Gum, especially tupelo, is recommended as a substitute for maple and it probably will, to some extent, displace it. It is darker in color and somewhat softer, but it wears

evenly and it does not splinter much more than maple. Thorough seasoning is particularly essential. There is a large supply of gum in the South and its use for floors should be extensive.

"Under most conditions, the best floor can be had by laying the top floor diagonally, putting the plank lengthwise and the sleepers crosswise of the house, without any bearing on the side walls. Inequalities in settlement of the floor are then less liable to make trouble, the plank can be laid with minimum expense, and the top floor gives the best results after considerable wear. This costs for the top slightly more for laying and more for repairs. Where there is a pronounced amount of trucking in one route it is sometimes thought desirable to put the flooring parallel to this trucking, but where the amount of traffic warrants it would seem best to put a runway of steel plates.

"Wood block pavements may be used in place of the board floor. They are best used on top of a concrete sub-floor, with a 1-in. sand cushion between. With wood blocks care should be taken to obtain sufficient expansion joints, as many floors have failed from a lack of this precaution. One inch for 50 ft. is about the correct amount. Care should also be taken to avoid the use of creosoted blocks where flour or similar articles which are easily damaged by odors are handled. There is also a chance of such damage from tar used in the expansion joints. Zinc chloride is for this reason recommended as a preservative for wood blocks when used for freight house floors. Zinc chloride is cheaper than creosote, and in a freight house the blocks will not suffer from the leaching which takes place when they are exposed to the weather, the main objection to the use of zinc chloride for treatment of cross ties and paving blocks. It is almost impossible to get this kind of floor as smooth as a maple floor, but if properly laid it tends to wear smooth. It is adapted to points where wear is especially severe, such as are due to the handling of castings and heavy machinery. Its main advantages are in the ease with which it can be repaired. The blocks are ordinarily made of pine. It would seem that gum blocks would be better. Maple blocks are also used but are expensive.

"Concrete has been used successfully where the wear is not too severe. There is a good deal of chance of damage by falling freight, and its use must be restricted to places where there is little chance of castings and similar articles being handled, unless the top surface is carefully made of the best of hard aggregates. Under such conditions excellent results have been obtained.

"A concrete sub-floor protected by a layer of asphalt mastic will give excellent results. It will cost more than the concrete floor, but it will not chip and scars made in its surface soon disappear. It is not so cold as the concrete floor and has been used for this purpose with success.

"Asphalt blocks properly made would seem to have some advantage for this purpose. They should make a smoother floor than the wood blocks and can be more easily repaired than the mastic floor."

ELECTROLYSIS

Following the acceptance of an invitation extended by the American Electric Railway Association to unite with it in jointly considering the subject of electrolysis, a joint committee composed of D. J. Brumley, George Gibbs and G. B. Katte, representing the steam roads, and Martin Schreiber, W. I. Trench and H. U. Wallace was appointed.

The report of this joint committee stated that the matter was receiving the careful consideration of electrical engineers in conference with structural engineers and representatives of various municipal departments, but up to the present time there had been no unanimity of opinion as to the best methods of preventing electrolysis or of protecting metal structures adjacent to the path of grounded return circuits. For this reason the committee could not recommend any standards or preferred practice, but it compiled,

as information, a statement of methods pursued and a description of the research work of particular interest to railway engineers which was now under way at some of the more important localities. The descriptions were prepared to cover locations as follows: Brooklyn Bridge, Brooklyn Traction System, Grand Central Terminal in New York City, Pennsylvania Terminal in New York City, Chicago Traction System, Bergen tunnels of the Delaware, Lackawanna & Western Railroad, and Baltimore & Ohio Railroad Terminal in Baltimore, Md.

In addition to this brief description of actual conditions there was submitted a short explanation of the phenomenon of electrolysis and the more common methods of preventing its action.

PROCEEDINGS OF THE CONVENTION

The first session of the fourteenth annual convention of the American Railway Engineering Association was opened by President Charles S. Churchill, chief engineer Norfolk & Western Railway, more than 350 delegates being in attendance.

Following the reading of the minutes of the last convention, which were approved as printed, President Churchill made the annual address. This included a forceful discussion of the necessity for the skilful and economical direction of labor in the handling of railway materials. He said that this should also apply to the manufacture of railway materials, for it was the only guarantee of uniform quality as evidenced by the experience of the association's rail committee. He then referred to the beneficial results obtained by the tests and investigations of the rail committee, which had shown that while rail failures in the past have had as many explanations as there were manufacturers, with no means of proving or disproving any of them, the general causes were now known and the remedies were being worked upon. The amount of discard from the top of ingots did not set a gage on either the high standard of the rail produced or the number of rail failures, but rather indicated the relative skill of some mills in controlling the chemical content, casting ingots and rolling rails. Some mills continuously produced better or more uniform material than others and this uniformity was largely the result of greater care and skill at the mills, which had been considerably developed by the publications of the association. It was being found that the use of thick base rails of the A. R. A.—"B" type was reducing base failures to an insignificant number, and also that care in handling and using rails was productive of both longevity and safety; in fact, that careful labor should follow the treatment of rails until they were removed from main tracks. In concluding, Mr. Churchill said: "The American Railway Engineering Association can aid in the development of skill in labor efficiency just as it has developed and must continue to improve the standards of materials and specifications."

The annual report of the secretary and treasurer showed cash on hand Jan. 1, 1913, of \$3,183 in excess of what it was at the same date in 1912. Following the address of the president and report of the secretary and treasurer, the report of the committee on rules and organization was presented. As a result of a lengthy discussion Rules 36 and 37 were eliminated and the rest of the report adopted as read. The committee report on signals and interlocking was received next. The most important part of this report was the final adoption of a uniform system of signals, which included three schemes, one for one-blade signals and the others for two and three-blade signals. This subject had been under discussion for a number of years and the members of the association were of the opinion that no definite conclusion could be reached. This same report had been approved by the Signal Association through letter ballot, the vote standing 574 for to 10 against. The adoption of this report by the engineering association has

now enabled it to be referred finally to the American Railway Association.

The report on the effect of treated ties on the operation of signals was approved as presented and the subject of possible economies in labor of signal maintenance was referred to the committee for report next year.

Continuing the program, the committee on track reported specifications for track fastenings and accessories which were adopted with slight changes. The report of the committee on rail was received and adopted with brief discussion.

The recommendations of the committee on wooden bridges and trestles brought out considerable discussion, particularly along the line of the necessity of inner and outer guard rails on all bridges. The conclusion recommending as good practice the use of guard timber on all open-floor bridges was approved, but the use of guard rails for all bridges was referred back to the committee for further consideration. Some members objected to this stand of the association, saying that guard rails on all bridges were an unnecessary expense and that results did not bear out the benefits supposed to be derived from their use. The other recommendations of this committee's report were adopted with minor changes.

The report of the committee on signs, fences and crossings developed discussion, particularly on the manufacture and curing of concrete posts, but the committee's conclusions were adopted for publication in the manual. The specifications for track in paved streets were adopted as read by the committee.

ANNUAL BANQUET

The annual banquet was given in the Gold Room of the Congress Hotel Wednesday night, March 19. President Churchill acted as toastmaster, and the speakers of the evening were B. A. Worthington, president Chicago & Alton Railroad, whose subject was "Looking Into the Future;" Rev. R. W. Dickie, of Montreal, Canada, who spoke on "Internationalism"; George A. Post, president of the Railway Business Association, whose subject was "The Effect of Music Upon Railways," and C. J. Rennick, of Peoria, Ill., who concluded the program with an address entitled "The Twentieth Century Pattern."

ELECTION OF OFFICERS

The new officers of the American Railway Engineering Association were announced by President Churchill to be as follows: President, E. F. Wendt, assistant engineer Pittsburgh & Lake Erie Railroad, Pittsburgh, Pa.; first vice-president, W. B. Storey, Jr., vice-president Santa Fé System, Chicago; second vice-president, Robert Trimble, chief engineer maintenance of way Northwest System, Pennsylvania Lines, Pittsburgh, Pa.; treasurer, George H. Bremner, engineer Illinois District, Chicago, Burlington & Quincy Railroad, Chicago, and secretary, E. H. Fritch.

The Thursday morning session of this association opened with the committee's report on yards and terminals. The report of the committee on electricity, including electrolysis, was received as information. The report of the committee on ballast brought forth some discussion as to the method of testing the quality, but the revised specifications for tests of this character were adopted for publication in the manual as recommended practice. Under the subject of buildings the recommendations as to design and construction of freight house floors were adopted and the committee was requested to include reference to the concentrated loads coming from electric trucks which are now being introduced in the larger freight houses. This committee's conclusions regarding metal roofing were adopted, and it was also instructed to abstract the descriptive material on prepared roofing contained in its report for publication in the manual. The report of the roadway committee was received as information, and the committee was requested to proceed along similar lines, reporting at the next convention.

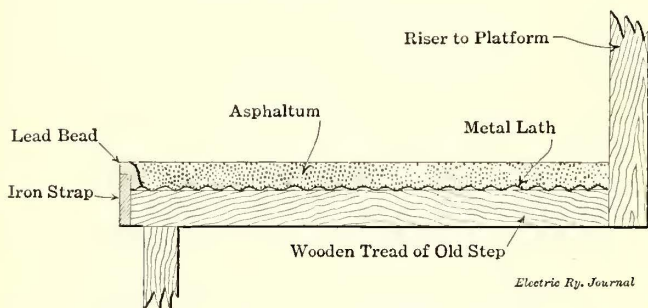
The program of the convention was completed at noon on Thursday, March 20, and the association adjourned, Friday, March 21, having been assigned for the inspection of the exhibit of the National Railway Appliances Association. A partial list of the exhibitors is published on page 553 of this issue.

ANNUAL MEETING OF THE RAILWAY APPLIANCES ASSOCIATION

The annual meeting of the National Railway Appliances Association was held in Chicago on March 18, with President A. P. Van Schaick presiding. After the president had made his annual report to the association, which included comment of an optimistic nature on the increased interest in exhibits from year to year and the excellent financial condition of the association, the report of the nominating committee was presented and adopted. The officers for the ensuing year are as follows: President, T. R. Wyles, Detroit Graphite Company, Detroit; vice-president, N. M. Hench, Carnegie Steel Company, Pittsburgh, and treasurer, J. N. Reynolds, *Railway Age Gazette*, Chicago. The new members of the board of directors for the next three years are: J. A. Brown, *Pocket List of Railroad Officials*, New York, and E. H. Bell, Railroad Supply Company, Chicago. E. E. Hudson, of Thomas A. Edison, Inc., Orange, N. J., was appointed to serve as director for one year. The report of the treasurer for the fiscal year ended April 30, 1912, showed that the association's assets amounted to \$13,225 with no liabilities.

HOME-MADE SAFETY TREAD

The mechanical department of the Cedar Rapids & Marion City Railway Company, Cedar Rapids, Ia., has devised a very serviceable yet economical tread consisting of a section of metal lath tacked to the old wooden tread over which is spread a mixture of asphaltum saturated



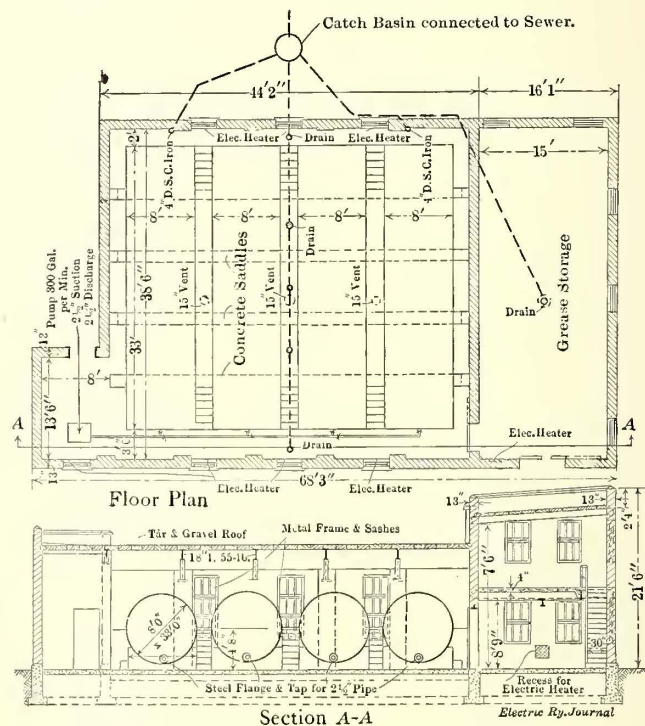
Home-Made Safety Tread for Surface Car Steps

with sand. The asphaltum wearing surface is approximately 1/2 in. thick and the metal lath acts as a bond between it and the 1 1/4-in. oak tread. In order to provide for equal wear and also to protect the edge of the tread against excessive rate of wear, a 3/16-iron strap is screwed to the edge of the wooden tread. This strap projects about 1/4 in. above the top of the wooden tread and the edge is then brought to the same level as the asphaltum by pouring a lead bead in a mold which brings the edge of the tread 1/4 in. above the iron strap. The bead is held firmly in place by extending it downward in back of the strap, thus giving it a bond to the metal lath. The wearing qualities of the lead and the asphaltum mixture are about the same so that step wear will be uniform over the entire surface. This lead bead and iron strap are applied before the asphaltum mixture. A section of this tread is shown in the illustration.

Seats are being provided for conductors on pay-as-you-enter cars in Los Angeles, Cal.

NOVEL OIL HOUSE AND OIL DELIVERY CAR FOR THE CHICAGO RAILWAYS

The engineering department of the Chicago Railways Company has completed plans and specifications for a new fireproof oil house and an oil delivery car. The oil house will be equipped with tank capacity sufficient to store oil to supply all the cars, carhouses, repair shops, generating stations and substations owned and operated by this company for a period of six months. This will require four tanks of 12,600 gal. capacity each and additional space for storage of oil in barrels. The building is so located that oil will be drained by gravity from steam railway tank cars in warm weather, an elevated track on a wooden trestle extending along one side of the building. The various kinds of oil will be pumped from the storage tanks into the company's oil delivery car by an electric pump of 300 gal. per minute capacity. By the installation of meters in the pipe lines from the tank cars to the oil house, in the pipe line from the oil house to the delivery car and in the delivery car lines to the local supply tanks, an accurate record will be obtained of all the oil which is received and consumed.



Chicago Oil Distribution—Plan and Elevation of Oil House

The system, a description of which follows, is the result of the experience of the mechanical department in buying and receiving oil in quantities at all times of the year. By purchasing a six months' oil supply during summer the expense of handling oil received in large tank cars is materially reduced as the necessity for heating the cars to make the oil flow in cold weather is obviated. By the purchase of oil in large quantities a minimum price is obtained and the expense of carrying the large quantity of oil in storage is more than offset by the reduced cost of handling. In addition, accurate records of the amount of oil used will be available when heretofore they have been almost impossible to obtain from all departments using oil.

BUILDING CONSTRUCTION DETAILS

The oil house will be 40 ft. 8 in. x 60 ft. 3 in. in plan, with a small annex 9 ft. x 15 ft. 8 in. in size, which will furnish space for the 300-gal. pump. The main building will consist of one large room arranged to receive the 12,600-gal. oil-storage tanks and a smaller room, 15 ft. x 38 ft. 6 in. in plan and two stories high, where oil and grease in barrels

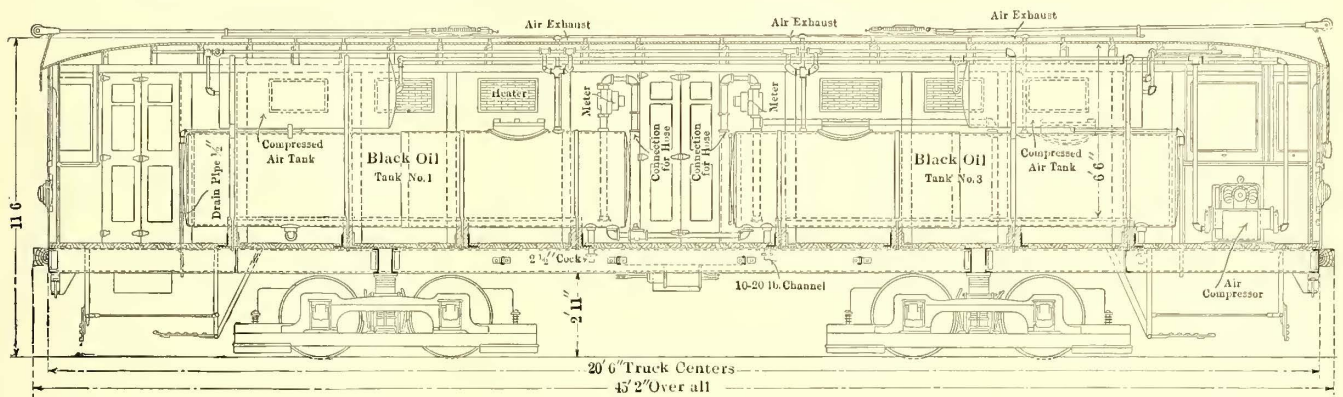
will be stored. The building will be constructed wholly of brick, concrete and steel. The 13-in. brick walls will be supported on 15-in. concrete foundations and the roof, which was designed to cover the building without supports other than the walls, will be carried on 18-in., 55-lb. I-beams. These beams will span the building in the 38-ft. 6-in. direction and will be supported on the pilasters built in the building walls. They will have a pitch of 2 ft. 4 in. in the width of the building so as to provide roof drainage. The roof is to be constructed of 3-in. x 12-in. x 17½-in. book tile, supported on 2½-in. x 2½-in. x ¾-in. tees 18 in. on centers. A tar and gravel roof coating will surmount the book tile and is to be sloped to drain to four 4-in. downspouts. These down-spouts are to be carried to the sewer system underneath the building by way of the inside of the building walls. Four 15-in. Kernschen type ventilators will be installed at uniform intervals along the center line of the roof.

As there is more liability of fire in the barrel storage room than in the large tank storage room and provision had to be made to carry the second-story wall over the

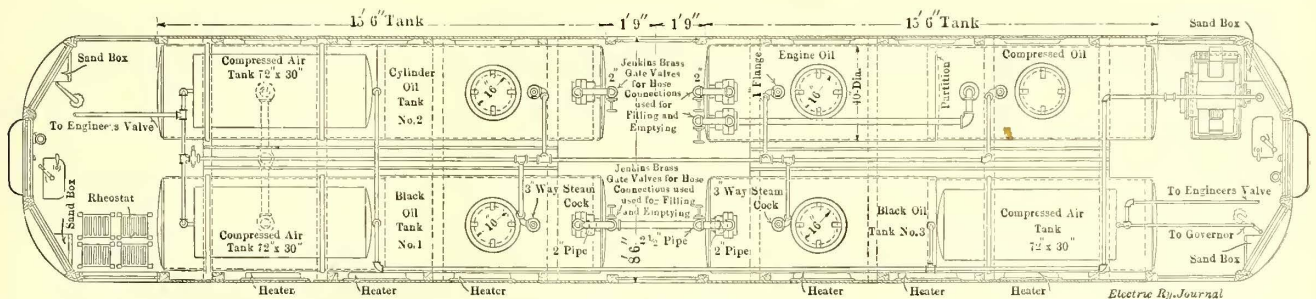
8 ft. 6 in. over-all width. The body is of segmental-arch, semi-steel construction, allowing a 6-ft. 6-in. clear head room. The total weight of the complete body with the tanks filled will be 83,000 lb. The body is mounted on St. Louis type trucks with a 4-ft. 6-in. wheelbase and 20-ft. 6-in. truck centers. The electric equipment will include four Westinghouse 319-B 40-hp motors with K-35 control.

Four 950-gal. cylindrical tanks will be installed in the car body. Two tanks will be used for the transportation of black oil, one for cylinder oil, and the fourth will be divided into two compartments, one for engine oil and the other for compressor oil. Each tank is mounted on four timber supports which rest directly on the underframe. The tanks are held in position by straps, the ends of which are bolted to the supporting timbers. The car body will be equipped with a sufficient number of electric heaters to assure a temperature near 70 deg. These heaters will be installed on the sides of the car slightly above the tanks.

The oil will be kept under an air pressure ranging from 65 lb. to 85 lb. per square inch by a motor-driven compressor installed at one end of the car. This compressor



SECTIONAL ELEVATION



SECTIONAL PLAN

Chicago Oil Distribution—Plan and Elevation of Special Oil Car

roof, a 13-in. brick fire wall will separate the two, and the single opening will be provided with an automatically closing steel door. All sashes and frames are to be built of pressed steel, glazed with wire glass.

The large oil tanks will be cylindrical, being 8 ft. in diameter and 33 ft. long. They are to be supported in saddle bearings provided in four 16-in. x 4-ft. 8-in. concrete walls spaced at 7-ft. 2-in. centers. Each tank is to be provided with a steel flange and a 2½-in. tap for connecting to an oil-pipe line. In order to provide a runway over the tanks, reinforced concrete steps will be provided in the space between the tank ends and a 2-in. x 24-in. plank walkway will be constructed. Sufficient radiation will be installed to maintain the temperature in the building near 70 deg., thus assuring a free flow of oil at all times.

OIL DELIVERY CAR

As a part of the new oil-storage and delivery system the Chicago Railways Company is building a double-end car designed especially for oil delivery service. The general dimensions of this car are 45 ft. 2 in. over-all length,

will also serve the air-brake equipment. Air reservoir capacity will be provided by three cylindrical tanks, 30 in. x 72 in., supported on the tops of the oil tanks. As will be noted in the sectional elevation of the delivery car, the air piping is carried overhead upon hangers attached to the roof carlines.

The delivery and receiving valves to the oil tanks are situated in the aisle at the center of the car body. These valves are 2 in. in diameter and are provided with hose-coupling attachments. By tapping the tanks at the top and extending the discharge pipes into them to a point near the bottom, the oil is forced by compressed air through a screen at the bottom of the pipe to the outlet valves and thence through a hose connection conveniently located at the center of the car body. In order to remove any collection of sediment at the bottom of the tank two 2½-in. outlets and valves have been installed in the bottom near the ends of the tanks. These drain through the car floor. A 16-in. manhole has been provided in the top of each tank. The car will also carry a supply of saturated waste in cans.

MEETING OF THE COMMITTEE ON BLOCK SIGNALS

The joint committee on block signals of the American Electric Railway Engineering Association and the Transportation & Traffic Association met in the Green Room of the Congress Hotel, Chicago, on March 18, 1913. Those present were: J. M. Waldron, signal engineer Interborough Rapid Transit Company, New York, chairman; C. D. Emmons, vice-president and general manager Chicago, South Bend & Northern Indiana, vice-chairman; John Leisenring, signal engineer Illinois Traction System; Gaylord Thompson, chief engineer Ohio Electric Railway; B. E. Merwin, general superintendent Aurora, Elgin & Chicago, and C. H. Morrison, signal engineer New York, New Haven & Hartford.

The committee took up one by one the progress reports on each of the eight subjects which had been assigned to sub-committees.

The first of these, that of bringing the progress report on signaling up to date, had been assigned to Messrs. Waldron and Conn. Mr. Waldron reported that his report depended upon the data sheets, which had not yet been sent out. These were being handled by Mr. Morrison and Mr. Doyle, who had been appointed as a sub-committee to take care of that part of the work and to bring the bibliography of signaling up to date.

Mr. Morrison reported that he had taken up the matter of the data sheets with H. C. Donecker and had suggested that the form should be the same as that used last year. He had also suggested that Mr. Donecker should send out the data sheets, and with this suggestion the committee concurred. The committee also decided to send out with the data sheets a supplementary circular asking for information on cab signals and automatic train stops in connection with the work which had been assigned to Messrs. Waldron and Morrison as a sub-committee. It was decided to include in this supplemental circular the following list of questions, these being the same questions which the American Railway Association is seeking to have answered by the steam railroads of the United States:

(a) Have you had any practical experience in the use of automatic train stops?

(b) Have you had any practical experience in the use of cab signals or similar accessory signals?

(c) Have you had experience with accessory signaling devices (such as torpedoes), automatically placed or otherwise, operated when the signals were displayed against train movements?

Mr. Emmons suggested that requests for information should state clearly that they covered only the work installed between July 1, 1912, and July 1, 1913. In conclusion, Mr. Morrison stated that the data sheets would be sent out in the near future.

Mr. Doyle, to whom had been assigned the collection of data regarding the rules of the various commissions—state and interstate—was unable to be present. Mr. Emmons read a letter from him stating that he had written to all state commissions and had thus endeavored to find out what had been done by the legislatures of the various states. It was decided by the committee that it would be better for this sub-committee to postpone its complete report until the various state legislatures had adjourned, on account of the possibility that some bills might be passed which would affect the commission requirements. The information sent by Mr. Doyle was accepted as such, and the committee concluded that it ought to be returned to him to be embodied in his later and more complete report. This report will be taken up at the next meeting of the committee.

On the subject of standards, Mr. Waldron said that he did not see any reason why the signal companies and the committee could not get together on the design of spectacle castings, semaphore masts and other material so as to secure a uniformity in dimensions and in principles. G. K. Jeffries, in reply to a question by Mr. Emmons, said that the signals on the Terre Haute, Indianapolis & Eastern

and on the Union Traction Company of Indiana were interchangeable. They were of the same height and built to practically the same specifications. Mr. Leisenring said that the Illinois Traction System signals were interchangeable so far as that road was concerned but did not conform to those on the other electric lines using the semaphore type of automatic block signals. The question as to whether or not the mast on which the light signal was mounted was the same as that used for semaphore signals was answered in the affirmative by Messrs. Howe and Day, of the General Railway Signal Company.

The discussion developed that it was the sense of the committee that standards should be adopted as speedily as possible both for city and interurban lines. It was finally agreed that Mr. Leisenring would co-operate with a committee of manufacturers on the question of standards and make a report at the next meeting. The manufacturers' committee is to be composed of Mr. Griffin, Union Switch & Signal Company; Mr. Howe, General Railway Signal Company; Mr. Gammons, United States Signal Company; Mr. Nachod, Nachod Signal Company; Mr. Ward, Automatic Signal & Appliance Company, and representatives of manufacturers who are interested.

The discussion then turned to aspects, and Mr. Leisenring said that he thought it would be desirable for the committee to recommend all-light indications for slow-speed signals in preference to disk signals or combination disk and light signals. This would lead to the trolley contact companies being requested to conform to adopted light signal aspects in the design of their apparatus.

Mr. Morrison told about a case where an accident had occurred on his road as the result of inability to see clearly a light signal after a heavy train on a grade had pulled down the voltage, thus resulting in dimming the signal lamp. In this case a supplementary disk was considered by the state authorities who investigated the accident as a necessary part of the indication. He stated that the light signal was of the old type and that the newer light signals, which were visible at greater distances, would undoubtedly eliminate the necessity for supplementary disk indications.

At this point the discussion was devoted for a few moments to the effect of decreasing the voltages of light signals and to the general subject of the placing of light signals in city streets. Mr. Gammons said that it was his experience that a hood 18 in. deep was the proper size for best results. He had found that a hooded light could be seen at a distance of 500 ft. The discussion brought out the fact that the majority of the committee were in favor of establishing 500 ft. as the minimum requirement for a distance at which light signals could be clearly distinguished.

There was considerable discussion on the necessity for additional indications in connection with the use of trolley contact signals. Mr. Gammons said that he had experimented with an 8-in. lens for light signals under varying conditions and that he could see the red light clearly at 500 ft. with half voltage.

The sub-committee appointed to consider the subject of the recommendations for signals for suburban and interurban railways under various conditions held an informal meeting the night before the committee meeting, and at this time proposed recommendations were taken up one by one and discussed at length. In reporting for the sub-committee, Mr. Leisenring suggested that the subject be left open for further consideration, that another meeting of the sub-committee be held and that further co-operation with the manufacturers be secured, after which a more complete report would be presented.

The committee members were very much interested in an analysis of railway accidents for the past four years which was made by P. J. Simmen, of the Northey-Simmen Company. This appears on another page of this issue.

After considerable discussion Mr. Waldron decided that it would be desirable to appoint a sub-committee on records and statistics, assigning this work to Mr. Emmons. This was added to the committee's list of sub-committees' assignments.

The manufacturers' representatives who were present were C. P. Nachod, Nachod Signal Company, Philadelphia; R. F. Gammons, United States Electric Signal Company, West Newton, Mass.; Ralph Mosher, United States Electric Signal Company; K. Howe, General Railway Signal Company; F. E. Ward, Automatic Signal & Appliance Company, Cleveland; P. J. Simmen, Northey-Simmen Company, Indianapolis; H. W. Griffin, Union Switch & Signal Company; D. R. Day, General Railway Signal Company, and A. D. Cloud, *The Signal Engineer*. G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern, was present and participated in the general discussions.

After a short discussion on the best place to hold the next meeting it was decided to meet on Friday, June 13, following the June meeting of the Signal Association, and New Haven was agreed upon as the place.

ANALYSIS OF THE CAUSES OF RAILWAY ACCIDENTS

At the meeting of the joint committee on block signals of the American Electric Railway Engineering Association and the Transportation & Traffic Association which was held in Chicago March 18, P. J. Simmen, consulting engineer Northey-Simmen Signal System, presented the accompanying analysis of the causes of important steam railway accidents. This information is based on the reports of the Interstate Commerce Commission for four and a half years and covers all accidents on interstate railways which resulted in damage of more than \$10,000 to motive power, rolling stock and track.

Mr. Simmen emphasized the importance of considering statistics of this kind in relation to proposed signal installations, saying that if a record of accidents on electric

ANALYSIS OF CAUSES OF ALL NOTED STEAM RAILROAD ACCIDENTS, FROM JULY 1, 1908, TO JAN. 31, 1913

Cause of Accident	No. of Accidents	Percentage of Total
Preventable by a complete signal system:		
Open switch	38	10.5
Disregard of semaphore signal at danger	46	12.8
Disregard of caution signal under permissive movement	6	1.7
Head-on collisions due to neglect of orders by train crew	97	26.9
Head-on collisions due to neglect of orders by operator	48	13.4
Head-on collisions due to error in order by dispatcher	14	3.8
Rear-end collisions due to flagman (no signal system)	38	10.5
Collisions due to excessive speed	15	4.1
Side-swiping accidents, cars not in clear at sidings	0	0.0
Deraillments—due to broken rail	19	5.3
Deraillments—due to excessive speed	29	8.1
Dead engineer	1	0.2
Broken train	0	0.0
Unknown causes (estimated)	10	2.7
Total	361	100.0
Not preventable by any signal system:		
Unknown causes (estimated)	29	
Deraillments—due to bad track	49	
Failure of air	24	
Miscellaneous—not preventable by any signal system	49	
Defective rolling stock	44	
Total	195	
Accidents preventable by a complete signal system,	361;	64.8 per cent.
Accidents not preventable by any signal system,	195;	35.2 per cent.

roads and their causes were compiled it would serve as a basis from which important conclusions could be drawn and it would show the phases of operation which were in greatest need of protection.

The tabulation indicates that approximately 43 per cent of the 361 accidents recorded were due to the crew and dispatching system, and that open switches were the cause of more than 10 per cent of all preventable accidents, thus emphasizing the importance of protection for such conditions. Another illuminating result of the analysis is that showing the important part rolling stock and bad track play

in the unpreventable accidents with any signal system. From this tabulation it would appear that signals of the maximum obtainable efficiency would prevent only 65 per cent of all accidents.

After carefully considering the contents of this analysis of steam railroad accidents the committee decided to undertake the compilation of similar data for electric railroads. Mr. Simmen suggested that probably the best way to obtain complete as well as prompt replies would be to classify the accidents in the manner shown in the table and then to enter the number of accidents of each class for each year covered by the analysis. The committee accepted this suggestion as the proper method of procedure.

CHICAGO MEETING OF RAILWAY SIGNAL ENGINEERS

The March meeting of the Railway Signal Association, which is an organization of steam railroad signal engineers, was held March 17 at the Congress Hotel, Chicago, Ill. The program consisted of reports of six regular committees and one special committee. The report on power interlocking included specifications for annunciator bells, push buttons for bells, train drops, etc., also floor pushes, fuses, steel-pipe conduit and wrought-iron pipe conduit, the two latter subjects being handled by a sub-committee. All of the specifications except those for annunciator bells and push buttons were accepted with a few slight changes. The excepted specifications were referred back to the committee for further revision.

The committee on manual blocks submitted rules for the operation and maintenance of interlocking plants and block stations. One or two of the proposed rules brought out considerable discussion. The proposed rule permitting displacing hand signaling through defective interlocking plants by the use of a caution card authorizing movement of trains against interlocking signals displaying stop indications was very vigorously opposed by a few engineers. At the close of the discussion, however, the report of the committee was accepted and the committee was retired.

Specifications for apparatus and material were submitted for alternating-current automatic block signal systems for use on steam roads, and these were accepted as a whole. Revised specifications for wires and cables were submitted by the committee to which was assigned this particular subject, and the revisions were accepted by the association.

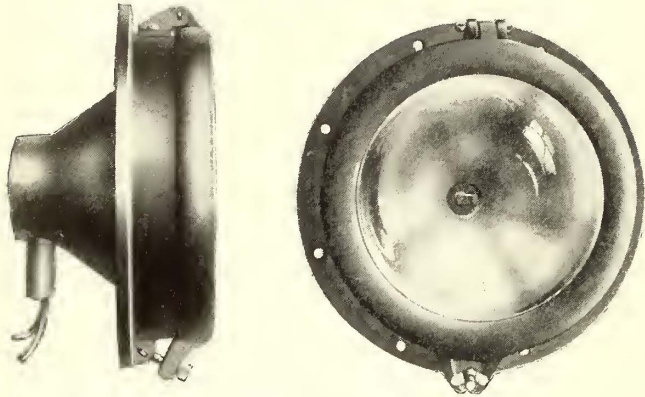
The committee on storage battery and charging equipment submitted as information a discussion on the use of Edison storage batteries for automatic signaling. This report was accepted. The report of the special committee on the method of recording signal performance, which recommended three forms of reports, was adopted, and after a brief discussion of the various factors included in the methods of computing efficiency of signal performance the committee was instructed to continue its work.

ELECTRIFICATION CONSIDERED FOR INDIA

C. H. Merz, consulting engineer for the Melbourne electrification, has been in consultation with the Bombay and Calcutta railway authorities concerning traffic congestion in those cities. The principal projects which the Indian authorities are said to have under consideration are: The electrification of the Bombay suburban lines of the Great Indian Peninsula and Bombay, Baroda and Central India Railways, involving from 50 miles to 100 miles of track; Calcutta suburban lines of the Eastern Bengal State Railway, beginning with 20 miles to 40 miles, and the Ghats (main line) section of the Great Indian Peninsula Railway, involving some 30 miles. The Ghats electrification will be of special interest on account of the severe grade conditions on this important line.

A NEW FORM OF HEADLIGHT

The Esterline Company, Lafayette, Ind., manufacturer of fog-penetrating lamps for marine service, familiarly known as the "Golden Glow" lamps, has recently brought out a lamp of similar construction for electric railway headlights. The design and construction of this lamp differs radically from other existing types in that the reflector, instead of being a metallic or an enameled surface, consists of a



Fog-Penetrating Headlight with Parabolic Glass Reflector

molded plate glass parabola ground accurately to size and shape, then polished and silvered like a French-plate mirror.

The glass has a greenish-yellow color which is about that of molten gold. It has long been recognized in lighthouse and marine work that a golden-yellow light will penetrate fog and mist to a much greater degree than a white light, and many recent tests on the Great Lakes and the seacoast show this principle to be correct. Experience shows the light to be much less dazzling to pedestrians and less fatiguing to the motorman than that of standard headlights. The reflectors, being made of glass, do not tarnish, but retain their luster indefinitely, and they can be cleaned without scratching the reflecting surface.

The lamps for street railway, interurban and electric locomotive service are built in two types. One, the hood type, is designed for mounting on top of the car or locomotive; the other, in which a part of the lamp is recessed into the surface on which it is mounted, is intended for mounting on the dashboards of street cars.

The housings for the reflectors are of metal and the glass parabola is securely held in place with no possibility of its becoming loose or damaged. The illustration shows the dash type of lamp with the bulb removed.

A standard spherical incandescent bulb is used with a standard Edison base. The front, or door, of the lamp is hinged at the top. The upper hinge is made adjustable so that all the play can be taken up and the front cover pressed tight against a gasket, rendering the lamp practically water-tight and dust-tight. The front glass is held in by means of spring clips which, while they hold the glass securely in place, distribute the strain in such a manner as to render cracking of the glass very unlikely. The lower clamp for the cover is of the thumb-screw type with the screw turned back in order to keep it out of the way. In the design of the lamp all unnecessary projections which would be likely to catch wires or trolley ropes have been omitted.

On account of the great efficiency of the reflector, the heat as well as the light is reflected so that the front glass will not remain coated with snow or ice in even the coldest weather.

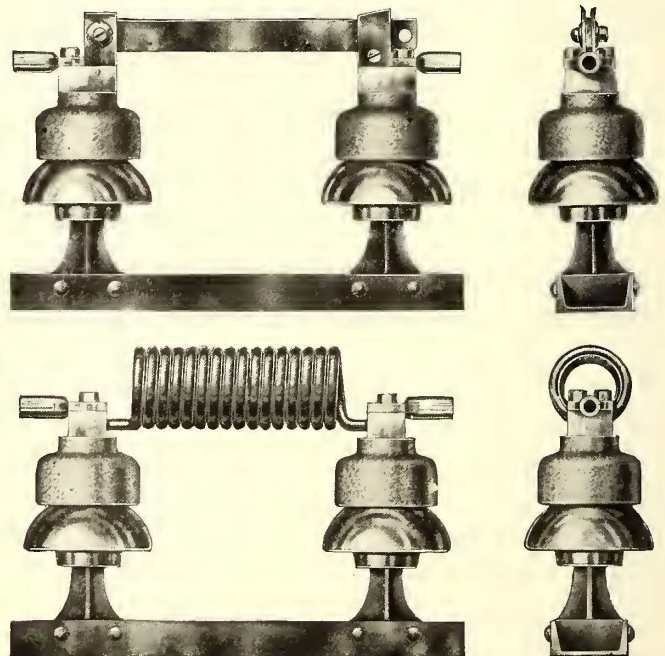
In deciding a suit between the Union Gas & Electric Company and the Cincinnati, Newport & Covington Traction Company, Judge Dickson, of Cincinnati, Ohio, ruled on March 3 to the effect that the franchise of a public service company cannot be revoked by the Legislature.

CHOKE COILS AND DISCONNECTING SWITCHES

The choke coils and disconnecting switches shown in the accompanying illustrations are typical of a new line of such apparatus recently brought out by the Electric Service Supplies Company. The bases of both the coils and the switches are of standard 3-in. channel iron. These bases permit the apparatus to be installed either inside or out, to be attached to switchboards direct, to cross-arms, to poles, to pipe or to any other suitable supporting means. Iron pins are riveted to this channel and insulators cemented to these pins support galvanized-iron tops which are cemented to them. In turn, these tops support brass terminal blocks for either the choke coil or the switch mechanism. The choke coils are sweated into these blocks and in every case are provided with separable terminals. The coils are air-insulated between turns so that if arcing should occur between turns the insulation (air) is immediately re-established after the passage of the discharge.

The company asserts that these choke coils possess great electrical and mechanical strength and that they afford great protection to electrical apparatus when used with its standard types of Garton-Daniels lightning arresters.

In the disconnecting switch the clips are sweated into the brass terminal blocks and are made of machine-finished, hard-drawn copper. The blades are hung in the clips as shown, and tension screws are provided at each end to secure proper contact. Separable terminals are provided on these switches for all capacities. These switches are designed and intended for use not only as lightning arrester disconnecting switches to disconnect arresters from the line for purposes of inspection, repair, etc., but also as switches for disconnecting and controlling high-voltage



Views of Disconnecting Switch and Choke Coil Mounted on Channel Iron Bases

lines, branch feeders, emergency feeders, etc., and for numerous other purposes for which such switches are required.

Both choke coils and switches are made for ratings up to 23,000 volts and of suitable ampere capacities to meet any operating conditions.

The National Assembly of Panama has passed a law granting free admission for material and supplies for the construction and maintenance of the Panama Street Railway.

EXHIBITS AT AMERICAN RAILWAY ENGINEERING ASSOCIATION CONVENTION

The annual exhibition of railroad apparatus given in Chicago during the past week by the National Railway Appliances Association was the largest in its history. In fact, the large number of exhibits made it again necessary to make use of the First Regiment Armory in addition to the Coliseum.

Following is a partial list of the exhibits which were of especial interest to electric railways:

ADAMS & WESTLAKE COMPANY, Chicago.—Signal lamps, lanterns and other railway specialties.

AJAX FORGE COMPANY, Chicago.—Manganese steel, one-piece guard rails, frogs, guard-rail clamps and switch accessories.

AMERICAN GUARD RAIL FASTENER COMPANY, Philadelphia, Pa.—“Vaughan” rail anchors, guard-rail clamps, tie plates and guard-rail fasteners.

AMERICAN LOCK NUT COMPANY, Chicago.—Lock nuts.

AMERICAN RAIL JOINT COMPANY, Niagara Falls, N. Y.—Reinforced angle bars.

AMERICAN ROLLING MILL COMPANY, Middletown, Ohio.—American ingot iron, corrugated culverts and plate. Link from Newburyport (Mass.) Bridge, made of pure iron, 100 years old.

AMERICAN STEEL & WIRE COMPANY, Chicago.—Steel fence posts, wire fencing, cables, switch ropes, telegraph and telephone wire.

ASPHALT READY ROOFING COMPANY, New York.—“Protection” brand of prepared roofing.

ASSOCIATED MANUFACTURERS' COMPANY, Waterloo, Ia.—“Jerry Boy” gasoline motor section car.

ATLAS PRESERVATIVE COMPANY OF AMERICA, New York.—Literature and photographs of effect of “Atlas” weed killer.

BARRETT MANUFACTURING COMPANY, New York.—Waterproofing, damp-proof paint and “Barrett” specification roofing.

BEAVER DAM MALLEABLE IRON COMPANY, Beaver Dam, Wis.—Tie plates, rail and braces.

LEWIS BLESSING, Jackson, Mich.—Noiseless joint and reinforced concrete tie with rail fasteners.

BLOCKI BRENNAN REFINING COMPANY, Chicago.—“Carboxide” elastic metal preserver.

S. F. BOWSER & COMPANY, Fort Wayne, Ind.—Sample oil-tank storage system.

L. S. BRACH SUPPLY COMPANY, New York.—Automatic flagman, lightning arresters and volt-meters.

BRYANT ZINC COMPANY, Chicago.—Crossing signals, bells and signal department supplies.

THE BUDA COMPANY, Chicago.—Gasoline motor section and inspection cars, bumping post and crossing gates.

THE PHILLIP CAREY COMPANY, Cincinnati, Ohio.—“Carey” roofing, waterproofing and veneer.

CARNEGIE STEEL COMPANY, Pittsburgh, Pa.—Steel switch ties, sheet piling, wheels, gears, axles, “Duquesne” rail joints and splice bars.

GEORGE B. CARPENTER & COMPANY, Chicago.—Cordage, pulleys, chain hoists and pumping outfit.

CHICAGO PNEUMATIC TOOL COMPANY, Chicago.—“Rockford” gasoline motor car, gasoline motor air compressor, portable electric drill and air drills, hammers and chisels.

CHICAGO STEEL RAILWAY TIE COMPANY, Chicago.—Steel railway ties, installed in section of standard track.

CLEVELAND FROG & CROSSING COMPANY, Cleveland, Ohio.—Frogs, switches, switch stands, manganese steel rail crossings.

COMMERCIAL ACETYLENE RAILWAY LIGHT & SIGNAL COM-

PANY, New York.—Flashing signals, acetylene headlights and signal lighting.

CONLEY FROG & SWITCH COMPANY, Memphis, Tenn.—“Conley” frogs in several designs.

COOK RAILWAY SIGNAL COMPANY, Denver, Col.—Automatic a.c. and d.c. block signals, automatic railway crossing gates and dry storage batteries.

COOK'S STANDARD TOOL COMPANY, Kalamazoo, Mich.—Track jacks, cattle guards, track drills and tool grinders.

THE CURTAIN SUPPLY COMPANY, Chicago.—Car curtains, ring curtain fixtures, “Rex” all-metal rollers and sash balances.

DETROIT GRAPHITE COMPANY, Detroit, Mich.—Paint samples and views of structures painted with Detroit graphite.

EUGENE DIETZGEN COMPANY, Chicago.—Surveying instruments and civil engineers' supplies.

DILWORTH, PORTER & COMPANY, Pittsburgh, Pa.—Railroad spikes and tie plates.

JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J.—Samples of natural graphite as taken from mine.

THE G. DROUVÉ COMPANY, Bridgeport, Conn.—Window-operating devices and skylights.

DUPLEX METALS COMPANY, Chester, Pa.—Copper-clad steel wire and line accessories.

THE EASTERN GRAPHITE ROOFING COMPANY, Chicago.—Samples of “Eastern Graphite” prepared roofing.

EDISON STORAGE BATTERY COMPANY, Orange, N. J.—Storage batteries for general railway use.

THE ELYRIA IRON & STEEL COMPANY, Elyria, Ohio.—Tie plates, compromise rail joints and spikes.

FAIRBANKS, MORSE COMPANY, Chicago.—Gasoline motor section cars, jacks and gasoline engines.

FAIRMONT MACHINE COMPANY, Fairmont, Minn.—Motor section and inspection cars.

FEDERAL SIGNAL COMPANY, Chicago.—Interlocking plant apparatus, both mechanical and electrical, signal mechanisms.

THE FRICTIONLESS RAIL, Boston, Mass.—Sample of frictionless rail section and views of installations.

GENERAL ELECTRIC COMPANY, Schenectady, N. Y.—Motors, switchboards, lamps, portable air compressors and mercury arc charging set.

GENERAL RAILWAY SIGNAL COMPANY, Rochester, N. Y.—Light signals, semaphore signal, switch box and indicator, electric interlocking machine, signal accessories.

GORDON PRIMARY BATTERY COMPANY, New York.—Crossing bells and signals, potash batteries.

LAWRENCE GRIFFITH, Yonkers, N. Y.—Griffith shoulder tie plate, insulated rail joint.

GRIP NUT COMPANY, Chicago.—Grip nuts, dust guard and “Monogram” boat fastener.

HALL SWITCH & SIGNAL COMPANY, New York, N. Y.—Automatic block signals, interlocking machines and signal accessories.

HAYES TRACK APPLIANCE COMPANY, Richmond, Ind.—“Hayes” derails.

HOBART-ALLFREE COMPANY, Chicago.—“Smythe” derails.

HUBBARD & COMPANY, Pittsburgh, Pa.—Tools and accessories for track and line.

INDIANAPOLIS SWITCH & FROG COMPANY, Springfield, Ohio.—Solid manganese frogs and crossings, Indianapolis portable electric welding outfit.

INLANE STEEL COMPANY, Chicago.—Corrugated iron culverts and siding, tie plates, non-corrosive steel fence posts.

INTERNATIONAL INTERLOCKING RAIL JOINT MANUFACTURING COMPANY, Chicago.—Interlocking rail joint.

INTERNATIONAL STEEL TIE COMPANY, Cleveland, Ohio.—“International” steel railway and crossing ties.

IOWA GATE COMPANY, Cedar Falls, Ia.—Right-of-way and stockyard gates.

H. W. JOHNS-MANVILLE COMPANY, New York.—Prepared roofing, fiber conduit, insulating material.

KALAMAZOO RAILWAY SUPPLY COMPANY, Kalamazoo, Mich.—Gasoline motor cars, jacks, track tools.

THE KENNICOTT COMPANY, Chicago.—Filters and water softeners.

KERITE INSULATED WIRE & CABLE COMPANY, New York.—Insulated wire and cable.

KEUFFEL & ESSER COMPANY, New York.—Drawing materials, surveying instruments, and accessories.

KEYSTONE GRINDER & MANUFACTURING COMPANY, Pittsburgh, Pa.—Portable grinding tools.

LACKAWANNA STEEL COMPANY, Buffalo, N. Y.—Sheet steel piling, hook shoulder tie plates, rail and rail joints.

THE LEHON COMPANY, Chicago.—Waterproof roofing and insulating paper.

LORAIN STEEL COMPANY, Johnstown, Pa.—Crossing frogs, switches of both rolled and cast manganese, switch stands, rail braces, switch points and guard-rail clamps.

THE LUFKIN RULE COMPANY, Saginaw, Mich.—Tapes and rules.

DAVID LUPTON'S SONS COMPANY, Philadelphia, Pa.—Steel sash, partitions and window-operating devices.

MARYLAND STEEL COMPANY, Philadelphia, Pa.—Track specialties.

C. F. MASSEY COMPANY, Chicago.—Reinforced concrete battery wells, culvert pipe and telephone booth.

MCGRAW PUBLISHING COMPANY, New York.—Exhibit of copies of current issues of *ELECTRIC RAILWAY JOURNAL*, *Electrical World*, *Engineering Record*, and *Metallurgical and Chemical Engineering*.

MORDEN FROG & CROSSING WORKS, Chicago.—Solid manganese railroad crossings, track specialties.

BURTON W. MUDGE & COMPANY, Chicago.—“Au-Tra-Kar” section cars and electric generating units.

M. & W. SUPPLY COMPANY, Philadelphia, Pa.—“Vaughan” rail anchors.

NATIONAL CARBON COMPANY, Cleveland, Ohio.—Dry batteries.

NATIONAL ELECTRIC SPECIALTY COMPANY, Toledo, Ohio.—Lightning arrester and signals for automatic blocks.

NATIONAL INDICATOR COMPANY, Long Island City, N. Y.—Destination signs for stations.

NATIONAL LOCK WASHER COMPANY, Newark, N. J.—Nut locks.

NATIONAL MALLEABLE CASTINGS COMPANY, Cleveland, Ohio.—Track specialties.

GEORGE P. NICHOLS & BROTHER, Chicago.—Electric turntable tractor.

NORTHEY-SIMMEN SIGNAL COMPANY, LTD., Indianapolis, Ind.—Cab signal system, including car mechanism and dispatcher's signaling and recording board.

THE OKONITE COMPANY, Chicago, represented by the Central Electric Company, agents.—Insulated wires, cables, tape, etc.

SPENCER OTIS COMPANY, Chicago.—Automatic platform scales, tie plates and screw spikes.

THE P. & M. COMPANY, Chicago.—Anti-creeper and rail anchors.

C. F. PEASE COMPANY, Chicago.—Automatic blueprint, washing and drying machines.

PENNSYLVANIA STEEL COMPANY, Philadelphia, Pa.—“Manard” anvil face frogs, “Mayari” steel bolts and other track equipment.

POCKET LIST OF RAILROAD OFFICIALS, New York.—Pocket lists.

POSITIVE RAIL ANCHOR COMPANY, Louisville, Ky.—Rail anchors.

POTTER-WINSLOW COMPANY, Chicago.—Reinforced concrete telephone booths, battery wells and posts.

PROTECTIVE SIGNAL MANUFACTURING COMPANY, Denver, Col.—Highway crossing signals, annunciators, telephone selector.

THE Q. & C. COMPANY, New York.—Bonzano joints, anti-creeper and compromise joints.

THE RAIL JOINT COMPANY, New York.—Various types of rail joints.

THE RAILROAD SUPPLY COMPANY, Chicago.—Crossing signals, bells, signal accessories, tie plates, and derails.

RAILWAY TRACTION SUPPLY COMPANY, Chicago.—“Hercules” steel bumping posts.

RAMAPO IRON WORKS, Hillburn, N. Y.—Switch stands, switch points, frogs and steel ties.

THE RELIANCE MANUFACTURING COMPANY, Massillon, Ohio.—Nut locks.

RHINELAND MACHINE WORKS COMPANY, Chicago.—Ball bearings.

RICHARDS-WILCOX MANUFACTURING COMPANY, Aurora, Ill.—Railroad door hangers.

SELLERS MANUFACTURING COMPANY, Chicago.—“Sellers” anchor bottom, wrought-iron tie plates and angle bars.

SIGNAL ACCESSORIES COMPANY, New York.—Triple-lock switch machines, signal material.

SOUTHERN RAILWAY SUPPLY COMPANY, St. Louis, Mo.—“Saunders” corrugated car stopper.

STANDARD ASPHALT & RUBBER COMPANY, Chicago.—“Sarco” waterproofing for concrete floors and other purposes.

STANDARD UNDERGROUND CABLE COMPANY, Pittsburgh, Pa.—“Davis” cable terminals, insulated wire and cable.

STARK ROLLING MILL COMPANY, Canton, Ohio.—Non-corrosive iron, corrugated culverts.

STEEL RAILWAY TIE & APPLIANCE COMPANY, Denver, Col.—“Shane” steel railway tie and safety fastener.

TEMPLETON KENLY & COMPANY, LTD., Chicago.—Complete line of ratchet jacks.

TITANIUM ALLOY MANUFACTURING COMPANY, Niagara Falls, N. Y.—Samples of titanium steel products.

TOLEDO PIPE THREADING MACHINE COMPANY, Toledo, Ohio.—Pipe-threading and cutting tools.

UNION DRAFT GEAR COMPANY, Chicago.—“Cardwell” friction draft gear and rocker side bearings.

UNION SWITCH & SIGNAL COMPANY, Swissville, Pa.—Electro-mechanical interlocking machine, electro-pneumatic motion plate switch and lock movement, “B” and electric signal mechanisms, three-position signal, electric light signal, mechanical dwarf signal, relays, switch indicators and “Keystone” insulated rail joints.

UNIVERSAL METALLIC TIE COMPANY, Salt Lake City, Utah.—Metal cross ties.

VERONA TOOL WORKS, Pittsburgh, Pa.—All kinds of track tools.

WESTERN ELECTRIC COMPANY, Chicago.—Telephones, selectors, lamps, meters and wire.

WILLIAM WHARTON & COMPANY, INC., Philadelphia, Pa.—Manganese steel crossings, track specialties.

WINANS APPROVED PATENT RAIL JOINT COMPANY, Portland, Ore.—Rail joints.

WORTH WIRE WORKS, Kokomo, Ind.—“Cinch” fence stays for right-of-way fence.

WYOMING SHOVEL WORKS, Wyoming, Pa.—Shovels for track work and overhead construction gangs.

News of Electric Railways

Mayor Jost's Ideas on New Franchise

Brief mention was made in the *ELECTRIC RAILWAY JOURNAL* of March 15, 1913, page 517, of the ideas advanced by Mayor Jost, Kansas City, Mo., at the meeting in that city on March 6, 1913, to consider the question of the extension of the franchises of the Metropolitan Street Railway. Mayor Jost is quoted in part as follows in regard to the terms which he advocated at that meeting:

"I have some crude ideas perhaps about financial matters, but viewing the matter from a moral standpoint it is not to be measured solely between the city and the owners of this property. No man coming into this community and venturing his money has any right in the event of loss to expect to have it returned out of the city treasury. Still, there may be some reason from a moral standpoint not to examine too closely the whys and wherefores, but to stand ready at all times to protect the man who relies on the prosperity of the community and the assumption that capital invested here will be fairly treated. Therefore, I think that so far as bonds, notes and mortgage obligations are concerned it is a matter of municipal honor not to see them wiped out when the investment was made in good faith for a venture which has built up the community. I am not so liberal about your stock or your other obligations, but I am disposed to be extremely liberal about the outstanding bonds and mortgages regardless of their relation to the value of the physical properties. It is my disposition to protect the interests of those obligations. You have of that about \$29,000,000 representing borrowed money which went into this company and was expended.

"I should not like to see any man who holds a single dollar of notes or bonds lose 5 cents of his claim. What I have said with reference to reduced fares was with the thought that I would be the last man to press a reduction of fare to the obstruction of those claims. I do not say I yield on the question of reduced fares, for I am convinced that the proposed reduction will not strike at the integrity of those obligations. I cannot yield on this question of reduced fare, for I feel in honor bound even to the point of refusing to agree on a contract. At the same time I would not want to be a party to any contract that would contain within its four corners the poison that might destroy it. It is of no credit to make a bargain here and have it fail—better to make none.

"This contract ought to guarantee the integrity of the bonded debt—anything else would be indefensible. It must also carry with it the power of the city to prevent a recurrence of these trials by supervision of operation, holding the expense to a legitimate basis. It must carry absolutely the right to control service. It must be a contract to provide amortization of the property, which I call retiring obligations. For this purpose there must be a sinking fund and this fund must belong to the city. And when the obligations are retired, to that extent the city should become an owner of the property—equal to the obligation retired from the sinking fund. If we can work out a plan to maintain the integrity of these mortgage debts, I think that is all that reasonably can be expected. I am trying to satisfy myself, and if I do satisfy myself and it pleases, it is all right, and if it does not please, it is all right. My personal peace of mind is worth more than anything else.

"Inasmuch as you have no practical experience as to the effect of six tickets for a quarter and your arguments here are matters of theory, and as the company once offered six tickets for a quarter, I suggest that this shall be the rate of fare for a period of three years, definite, fixed and certain. If at the end of that time it develops that the fare has not produced a sufficient return to yield 6 per cent on an amount equal to the present mortgage indebtedness, plus a like return on the amount expended to rehabilitate the property, as outlined in the Arnold report, and to create a sinking fund for amortization, then let the fare automatically return to 5 cents for a sufficient time to recoup any losses of the three-year period and until such time as the earnings show ability to return to the 4-cent fare.

"While you say your company has not prospered here, I

think it has prospered. But if it has not prospered it has not been because the field has not been a good one. You have failed because of the rapid growth of the city, demanding extensions of your property into temporary unprofitable territory. You have had to replace equipment to keep pace with a rapid change of motive powers. You have had to rebuild lines because of seepy ground as on Troost Avenue, where the rails were laid three times. These conditions have made your investment unprofitable if it has been unprofitable. Somebody has got to lose something.

"While this is the condition of the Metropolitan Street Railway there is the twin corporation, the light company. It has been very, very prosperous. I suggest that the light company take care of the stock of the Metropolitan Street Railway so not a stockholder need lose a cent. I also suggest that you turn over to the electric light company with a view to reducing the capitalization of your company the power house at Second Street and Grand Avenue. Let the company buy its power and pay for it no more than commonly is paid for power and let it be understood that the city is a party to that contract to protect against any excessive rate.

"I want the city to have a hand in the operating of this property because I know that abuses can grow up so as to make utterly ineffective the six tickets for a quarter provision and the company might be so operated as to make a 5-cent fare inevitable. I would want a supervisor and not one appointed by the Mayor alone. I would not want him to change with administrations or be the subject of political fortunes. If he were appointed by the Mayor your company every year would be a figure in political campaigns. I suggest a nomination to this position by the Mayor or some suitable and qualified person, to be examined by a representative of the company, the presiding judge of the Circuit Court and a third chosen by the two. I suggest power to the Mayor to remove subject to approval by the Circuit Court after a hearing or some such plan."

Public Service Commissioners Hale and Olmsted on Their Work

J. H. Hale, a member of the Public Utilities Commission of Connecticut, was the guest at a recent luncheon of the members of the Hartford Business Men's Association. He addressed the members of the association on the subject "Practical Workings of the Public Utilities Law." He put the matters that came before the commission under three heads, those which the commission took up of its own initiative, those resulting from individual petitions from people throughout the State and those that came from the corporations themselves. After referring to the work of the commission in connection with the steam railroads Mr. Hale said that one of the most important matters that had come before the commission was the Manchester rate case. The people of Manchester desired a reduction in fare over the lines of the Connecticut Company between Hartford and Manchester. A searching investigation had been made by the commission and at one time it was thought that the fare could be reduced, but it was finally found that if the rate was lowered the railroad would not receive sufficient compensation to permit it to give good service and the commission believed that good service was the first essential to be considered. Mr. Hale also referred to the petition to the commission in regard to the lowering of car steps and to the order issued by the commission in this respect. He concluded his remarks in part as follows:

"It has been very easy to rail at and complain about the public service corporations, but we should consider that their officers are our fellow-men and that they are business men themselves. We have been at fault in not going before them and talking it out with the heads of the companies on a business basis. We complain to a conductor of an electric car and blame the railroad because the trouble is not corrected. When we go into a store and are not treated right, we do not complain to the porter or to the errand boy, but we seek the manager and talk it out man fashion, and usually get satisfaction. All that these public

service corporations have to sell is service, and good service sells better than poor service, for no man ever made money out of dissatisfaction."

John B. Olmsted, formerly a member of the Public Service Commission of the Second District of New York, spoke somewhat along the same lines as Mr. Hale in an address which he made at Amsterdam, N. Y., just before his retirement from the commission. Mr. Olmsted said in part:

"I came into office with decided leanings toward the anti-corporation view of public utility questions. Want of knowledge as to the precise point involved I have found in many cases to be the principal cause of the prejudices I then entertained. Experience has taught me that there is another side to these questions, and one not lightly to be dismissed. I have changed my mind also as to the attitude of most corporation managers toward the public. I had expected to find it recalcitrant and objurgatory. I have found it almost uniformly, when expressed in the presence of the commission, conciliating and willing to abide by the results of a fair hearing. The difficulty with me has been not so much in getting the corporation to do what I thought was right as to determine in my own mind what under all the circumstances of certain cases was right.

"I am fully aware that this is not the popular view of public service corporations. I say that a better knowledge of the conditions under which their business is carried on brings one to a more just appreciation of some of the difficulties under which they labor. I know well that there are many—very many—particulars in which the service which they are rendering may be improved. Let us be reasonable as well as critical. Let us realize that the management of 1000 men on a street railway is no less difficult than the management of an equal number in a factory, and that there are times when you have to do the best you can with the material with which you have to work.

"The up-to-date railway or electric light official stands ready to listen to any reasonable complaint that may be brought to his attention. I am not innocent enough to believe that all the dark, devious and easy ways of 'getting there' have been wholly abandoned; but I do hold the view that the street called 'Straight' is a much more popular thoroughfare than it used to be, and that the directors and agents of the corporations over which we have control are walking it with much clearer consciences and with great gain to their self-respect.

"I have intimated that one great difficulty with certain corporations is the lack of means to carry out the improvements to service which their operating men admit would be advisable and desirable. On this point some figures from our last annual report may be illuminating. Out of seventy-eight steam railroads reporting to the commission in this State, only twenty-seven paid any dividends for the current year. Out of 364 electric railroads, light, heat and power and gas corporations, 237 paid no dividends. In 1909 it was 237 out of 310, so that conditions are improving; but the figures are significant. They are contradictory to the general impression that dividends are the foundation upon which all public service corporations are erected.

"The Public Service Commission is organized to hand out justice, as nearly as it can determine it, both to shippers and to carriers, to consumers and to producers, and if it has attained some success in its work of the last five years it has done so by a strict adherence to that view, and not by spectacular brandishings of the 'big stick.' It has accomplished more good by getting both parties before it, pointing out the strength or weakness of opposing views, and then appealing to that sense of fair play which is inherent in every man, than it ever has by a display of the tremendous powers which the law undoubtedly confers upon it."

Mr. Mullaly on Transportation for the San Francisco Exposition

At the ninth annual banquet of the Transportation Club of San Francisco, held recently at the Palace Hotel in that city, Thornwell Mullaly, assistant to the president of the United Railroads of San Francisco, speaking on the subject "Transportation for the Exposition and for San Francisco," said in part:

"The subject I have been asked to speak on is 'Transportation for the Exposition and for San Francisco.' I have

been asked to speak in the capacity of the acting head of the principal street railway of the city. I am speaking to the Transportation Club, whose members are mostly transportation men. You are connected with the principal railway and steamship lines running to this city. Your companies are going to spend large sums of money in bringing people here. You are inviting the people of the world to come and tacitly agreeing that they will be properly received and cared for when they arrive.

"In view of all this it is incumbent upon me to state to you truthfully one fact. I am not stating this by way of a threat. I am not stating it for the purpose of gaining any advantage for the company with which I am connected. It is simply a fact which I should state at this time in order that you and others may know the truth in time and hereafter relieve us from responsibility in the matter. That fact is this: It is not possible for private capital to compete in street railroading with the city. If the city operates at a loss the taxpayers must pay. If a private company runs at a loss it goes into bankruptcy and out of business. Private capital cannot compete with a competitor which may take such streets as might be profitable and relegate private capital to unprofitable extensions, and which has the power if it so desires to pass ordinances in seeking to incommode. We go into the financial markets of the world and get the money with which to build lines, just as the city must do. We cannot get people to put their money into the building of unprofitable lines and it would not be right to do so if we could. Therefore, if the city wishes to establish a municipal street railroad system it, of course, may do so. But if it does it will render it impossible for us to build new lines or extensions, either to the Exposition or throughout the city.

"We regret this, but we cannot help it. It is not of our doing. The company, however, desires to be reasonable and fair with the city. It desires to do all it can to aid the Exposition and San Francisco. If the city desires municipal ownership, there is a plan in accordance with which the company will work in harmony, and municipal ownership can be brought about at any time the city wishes, and that, too, with a saving to it of hundreds of thousands of dollars.

"The company is willing to enter into a contract with the city called a franchise, under which it will obtain the money, build the necessary lines and extensions and turn them over to the city when it wishes. All it asks is fair protection for its investment and a reasonable return upon it. This the city must give by bonding itself if it builds its own lines. Private capital can build the lines at a saving to the city of many thousands of dollars. Of course, the city must get itself into a position to make such a contract by amending its present charter.

"There are two ways of increasing transportation facilities to the Exposition. One is by constructing extensions to the existing lines, the other is by constructing new lines. Two years ago at Washington I worked for the World's Fair bill. Our company is the second largest subscriber to the Exposition fund and we shall continue to do all in our power for its success and for the success of San Francisco."

Provisions of Missouri Public Service Commission Bill

Governor Major of Missouri on March 18, 1913, signed the Public Service Commission bill, which abolishes the elective State Railroad Commission and all municipal utility commissions in Missouri. The new measure creates a commission of five invested with full power to fix and regulate the rates of all public service corporations. It repeals the law by which the Municipal Assembly of St. Louis and similar bodies of other cities are empowered to create a local utilities commission by ordinance. It gives the commission exclusive jurisdiction in the abolition of grade crossings and the right to distribute the cost. It requires new railroads or street railroads to get a permit from the commission before beginning construction work. It prohibits the issuance of stocks and bonds, by any utility corporation without the permission of the commission.

The measure also compels utility corporations to set aside a certain amount of their earnings as a depreciation fund, upon determination by the commission. It empowers the

commission to ascertain the physical value of utility property for the purposes of taxation and to determine a fair profit on the money invested. It prohibits the issuance of passes by railroads except to physicians, lawyers, agents and shippers and not to exceed two bondsmen in each county. It makes the commission virtually a court, from which appeal is by certiorari to the courts. It provides that the commission must hand down decisions upon all orders affecting service or rates. It provides for a salary of \$5,500 for the five commissioners, \$4,500 for an attorney, \$3,600 for chief clerk, \$1,800 for all other clerks and \$1,200 for stenographers. The commission is empowered to appoint all necessary examiners, accountants, agents, experts, engineers, inspectors, etc.

The law strips the Legislature of further necessity to deal with railroads and other utility corporations. The commission will have full power to have three brakemen employed on all freight trains, if three are necessary; to compel the installation of electric headlights and construction of depots; to require additional switching facilities, improvement of track bed or rolling stock, and to regulate the expedition with which stock is handled. The commission is empowered to fix express rates within the State and to create free zones of delivery in incorporated cities. It is vested with power to compel the railroads and other utilities to produce their books and papers and to adopt a uniform system of accounting and to force the railroads to run their trains on time and furnish plenty of cars. Delay in the utilization of franchises is obviated by the bill. If a utility corporation gets a franchise from a municipality to construct a gas plant or street railroad or water works, it must within two years make substantial preparations to use its franchise. The law confers on the commission power to investigate interstate rates, and when these are deemed too high, to apply to the Interstate Commerce Commission for relief.

Development of Plans to Connect Pittsburgh and Wheeling

The representative of the West Penn Traction Company, Pittsburgh, Pa., secured franchises recently in Washington, Pa., under the names of the Washington Traction Company and the East Washington Traction Company, but the applications for charters to operate the lines as part of the proposed Wheeling-Pittsburgh system were denied by Governor Tener. W. E. Moore, general manager of the company, says in this connection:

"While we were disappointed in being forced to relinquish our immediate intention of building into Washington by reason of Governor Tener's action, we have not abandoned the project. The West Penn Company will connect with its Pennsylvania and West Virginia systems at an early date and within a comparatively short time will be running cars from Wheeling to Pittsburgh by way of Washington and the Monongahela Valley. The West Penn interests not only control the system of the Wheeling Traction Company but have also acquired the City & Elm Grove Railroad. We have the most feasible route surveyed from the Monongahela Valley to West Alexander, where we will connect with the Wheeling lines. The route is shorter than any other that has heretofore been surveyed between Washington and Wheeling."

Municipal Bus Line in Detroit

The first municipal motor bus line in Detroit was placed in operation recently between West Jefferson Avenue and Warren Avenue over Junction Avenue, Thirty-fourth Street, Buchanan Street and Scotten Avenue. The schedule provides for a bus each way every twelve minutes, and the fare is 3 cents. It is proposed to give this plan a thirty-day trial as a cross-town service. The vehicles seat twenty-eight passengers. The cars were patronized the first day largely by women and children. The number of passengers carried in the eight hours' operation the first day was 2405 and the receipts were \$61.35.

Manufacturers in the West Detroit River district are opposed to any step that will cause a cessation of operation of the Fort Street line, since this would interfere with the transportation of their employees and injure their business.

Some Councilmen favor ordering the company to cease operations in Fort Street.

Alderman John Lodge, who has charge of the preparation of the municipal ownership amendment to the Detroit city charter, has expressed himself in favor of the creation of a commission of non-salaried citizens to superintend railway transportation in the city.

Detroit's Municipal Ownership Charter Amendments

The municipal charter amendments for Detroit were presented to the City Council on the evening of March 13, and will lie on the table for fifteen days, as provided by the Verdier home rule law, preparatory to being submitted to a vote of the electors on April 7, the regular election day. Before being presented to the Council the amendments were changed by the Mayor's special counsel, at the request of the Mayor, but Corporation Counsel Lawson and Attorney Lucking, who prepared the amendments originally, refused to take part in the revision. They thought the matter should have more extended consideration. One of the principal changes made in the plan is that there shall be a board of three citizens in charge of the street railways instead of one, as originally provided.

As a check upon the board, another change in the amendments provides that all money received from any source in relation to the street railway shall be paid into the city treasury and disbursed only on vouchers signed by the president and secretary of the board and countersigned by the city comptroller. The portion relating to the sinking fund was amended so that the board may set aside from time to time such sums as it sees fit to retire the general bonds, but it must pay the mortgage bonds.

The charter amendments provide in brief for municipal ownership and maintenance and operation of street railways beneath, upon and above the surface of the streets of Detroit. There is to be a board of three street railway commissioners to be appointed by the Mayor, the members to serve without salary and be subject to removal at the will of the Mayor. Section 6 says that the board shall "proceed promptly to purchase, acquire or construct and to own and operate a system of street railways in and for the city of Detroit and as soon as practicable to make said system exclusive." The street railway board is empowered to purchase, lease or condemn all or any part of the existing street railway properties in the city of Detroit, and "said board shall construct, own, maintain and operate in said city, for said city, and within a distance of 10 miles from any of its limits, a system of street railways in and through and upon such streets and other places in Detroit and outside as the Common Council shall from time to time elect."

The Common Council is to bond the city of Detroit to the amount of 2 per cent of the assessed value of the real and personal property of the city on the request of the street railway board to provide funds for a public street railway in Detroit. Provision is also made for the issue of additional bonds to be secured by the property and revenues of the street railway system, including a security franchise stating the terms upon which in case of foreclosure the purchaser may operate the lines for a period not longer than twenty years from the date of purchase. This security franchise is to be submitted by the street railway board to the City Council and is then to be submitted to the electors for approval. The street railway board is to have control of the municipal street railway system "as fully and completely as if said board represented private owners."

The section covering the rate of fare follows:

"The rate of fare on said street railway system shall be sufficient to pay, and the said board shall cause to be paid: (a) Operating and maintenance expenses, including paving and watering between tracks; (b) taxes on the physical property of the entire street-car system, the same as though privately owned; (c) fixed charges; (d) a sufficient per cent per annum so as to provide a sinking fund to pay the principal of the mortgage bonds issued at their maturity and such other additional per cent per annum to provide, in the sound discretion of the board, a sinking fund to pay the principal of the general bonds issued as soon as practicable to the end that the entire cost of said street railway system be paid eventually out of the earnings thereof."

The question to be submitted to the electors of Detroit at the election on April 7 follows:

"Do you favor authorizing the city of Detroit to acquire by purchase or condemnation or construction and to own and maintain and operate street railways within the city of Detroit and within a distance of 10 miles from any portion of its limits, and to provide for the cost thereof by an issue of bonds of the city of Detroit to the amount of 2 per cent of the assessed valuation of the real and personal property of the city, and other bonds upon the property and revenues of the street railway, including a security franchise?"

New Haven Railroad Electrification Progress

The following very interesting statements in regard to the progress of the New York, New Haven & Hartford Railroad with the work of electrification of its lines are attributed to Timothy E. Byrnes, vice-president of the company:

"The electrification from Boston to Providence is complicated and to some extent delayed by the four-tracking of the road, which is going on at the same time. Once the electric system is completed to Providence, the gap between that city and New Haven, to which the electric system is now practically completed from New York, will speedily be closed.

"Then we will put on the four-and-one-half-hour trains from Boston to New York. We could easily make the running time between the cities less than four hours, all depending on the number of stops. The time of our electrically operated trains will be chiefly determined by the arrangements of the national government with regard to the drawbridges on the route. In any case we will better the time of our present five-hour trains.

"It looks to me as if there is a real chance that something will be done about the electrification of all railroads in the metropolitan district in the Massachusetts Legislature this winter. That this plan has been held up is not due to the roads but to a question of financing. Whatever is done in this case, I think the New York, New Haven & Hartford Railroad will be operating its trains by electricity as far as Providence in less than two years. Our dream has been the four-hour train between Boston and New York. I think it may soon be realized. In any case we will better the five-hour running time."

Commissioner Clark on Interstate Valuation Work.

Chairman Clark of the Interstate Commerce Commission was quoted in part as follows on March 18, 1913, in regard to the work of carrying out the law authorizing the commission to fix the value of the physical property of the common carriers:

"The work will be approached and proceeded with in a businesslike, impartial and thorough way. It is desirable that it should be done with accuracy and thoroughness. Necessarily it will take some time. Just how long no one knows. The valuation will comprehend securing reliable, authentic and exhaustive information upon which to base a determination of the original cost, the present and the productive value of these properties that exist under public franchises and perform public functions. When these have been ascertained, the commission will find the values of the several carriers, and the values so fixed will be prima facie evidence in the courts. Who knows the value of the property of a single carrier? One expert would say that its value is to be measured by the original cost, another by outstanding indebtedness, and another by reproduction value. The law requires that rates of carriers shall be reasonable. The courts have held that carriers are entitled to a fair return upon the value of their property. Manifestly the fair return cannot be determined until the value is known. The courts also hold that other factors must be taken into consideration."

Mr. Clark admitted that many difficulties presented themselves for solution in the work of valuing the railroads, but said that Congress would furnish funds for thorough work, which will proceed with dispatch. He is reported to have cited cases in which voluntary valuations which had been furnished to the commission by the railroad companies were questioned in court.

New York Rapid Transit Contracts Executed

The contracts with the Interborough Rapid Transit Company and the New York Municipal Railway Corporation (Brooklyn Rapid Transit) for equipping and operating the dual system of rapid transit, which will give New York City a subway and elevated system having 629 miles of single track and costing for new work and equipment upward of \$300,000,000, were signed in behalf of the Public Service Commission of the First District of New York on March 19, 1913. The commission adopted the contracts with the operating companies on March 4 and sent them to the Board of Estimate and Apportionment, which acted upon them at a special meeting and then returned them to the commission for execution. A digest of the eight different instruments involved in the new agreement was published in the ELECTRIC RAILWAY JOURNAL on March 15, 1913, and a summary of the terms of the operating contracts as approved by the commission was published in the ELECTRIC RAILWAY JOURNAL of March 8, 1913.

The contracts bind the city and the Interborough Rapid Transit Company and New York Municipal Railway Corporation to an agreement for forty-nine years dating from Jan. 1, 1917. They were signed in the assembly room of the commission in the Tribune Building. All the members of the commission were present, as were also Theodore P. Shonts, president of the Interborough Rapid Transit Company; Frank Hedley, vice-president and general manager of that company; Col. Timothy S. Williams, president of the Brooklyn Rapid Transit Company; George D. Yeomans, of that company, and other officers of the companies involved in the negotiations. Ex-chairman William R. Willcox of the commission had the honor of attesting the signature of his successor on the commission, Mr. McCall.

At the meeting of the Board of Estimate on March 19, at which the contracts were approved by that body and \$88,200,000 appropriated for the construction of the new lines, Borough President McAneny read the report of the board's conference committee on pending transit proposals, of which he was chairman. This report rehearsed the proceedings of the committee since its report of May 24, and said that the contracts as now presented for approval were "little more than the expression in exact contractual terms of the general transit plan to which the board has already subscribed." The financial side of the settlement was set forth as follows:

"The estimates submitted in May covering the contributions of both the city and the companies, whether for construction or equipment, and including also the item of real estate, reached a total of \$301,860,000. The third-tracking and extension of the Manhattan elevated system adds approximately \$25,000,000 more. The estimates as they have since been carefully revised and as now resubmitted are but \$67,000 beneath this figure. They are distributed as follows:

INTERBOROUGH SYSTEM.	
City funds.....	\$63,335,637
Company, for construction.....	56,260,000
Company, for equipment.....	21,000,000
Total	\$140,595,637
BROOKLYN SYSTEM.	
City funds for new work.....	\$72,005,991
City funds for Fourth Avenue and Centre Street loop lines..	28,496,000
Company funds for the construction of city-owned lines....	13,695,000
Company funds for improvements to its existing system....	21,000,000
Company funds for equipment.....	26,000,000
Total	\$161,196,991
Interborough system.....	\$140,595,637
Brooklyn system.....	161,196,991
Grand total.....	\$301,792,628

"The sum total of the required investment of the city is, therefore, \$163,837,628. Deducting the cost of the Fourth Avenue and Centre Street loop lines, the city's share for the new work will be \$135,341,628. This is \$1,030,572 less than the estimates of the city's share on account of both systems presented in May."

The system of rapid transit lines which will now be completed and placed in operation had its beginning with the old Rapid Transit Commission, which adopted a plan for a Manhattan-Brooklyn loop line from the Brooklyn Bridge north through Centre Street and east through Delancey

Street to the Williamsburg Bridge. The proposals and counter-proposals made following this beginning have been referred to from time to time in the *ELECTRIC RAILWAY JOURNAL* as the negotiations have proceeded, and are dealt with at considerable length in a sketch reviewing the entire situation prepared by the commission.

Electrification of Line Between Spokane and Seattle Reported.—It is reported that the Great Northern Railway is considering plans to electrify its main line between Spokane and Seattle.

Complete Signal System for Mesaba Railway.—The Mesaba Railway Company, Virginia, Minn., has contracted with the Northey-Simmen Signal Company, Ltd., Indianapolis, Ind., for a complete equipment of the Simmen signal system for its 36 miles of road. The work of installing the system will be started and completed during the coming summer.

New California Road Placed in Operation.—The Easton Railroad has been completed and placed in operation between the station of the Southern Pacific Railroad in Easton, Cal., and a point 4 miles back in the foothills. Service is being furnished with Edison-Beach storage battery cars. The company intends to extend the road to Burlingame.

New Office Building in Savannah.—The Savannah (Ga.) Electric Company's new office building, located at Bay and Whitaker Streets, Savannah, has been turned over to the company by the contractor, who has remodeled it into a most commodious and modern office edifice. By reason of re-routing of the cars last December, practically every car on the system passes the new office.

Progress of the Oakland & Antioch Railroad.—The Oakland & Antioch Railroad, Oakland, Cal., has completed its line from Oakland to Bay Point and Walnut Creek and expects to begin service between Bay Point and Oakland on April 7. The main line of the company from Bay Point through Antioch to Sacramento is nearing completion and the operation of trains between Oakland and Sacramento will probably be begun by July 1.

Act in Interest of Buffalo & Fort Erie Company Advanced.—The act in the interest of the Buffalo & Fort Erie Railway & Ferry Company, Fort Erie, Ont., has been reported to the Ontario Legislature by the railway committee. The company is authorized to electrify the road and make certain changes which will involve an expenditure of about \$300,000. The company is to be permitted to increase its capital from \$500,000 to \$1,000,000 and to issue bonds to the extent of \$600,000.

Decision in Toronto Deviation Case.—The Court of Appeal has handed down a decision in the city's appeal from the order of the Ontario Railway & Municipal Board, which approved the plans of the Toronto & York Radial Railway for the deviation of its line at Farnham Avenue on Yonge Street north. The Court of Appeal decided that the company had no right to cross the streets without the consent of the city. The company has already purchased the right-of-way and laid part of the track.

Referendum in San Francisco.—A referendum election has been called for April 22, 1913, on the traffic agreement between the city and the United Railroads, San Francisco, Cal., for the use of lower Market Street. The calling of the election by the supervisors was made necessary by the filing of a petition circulated by the Public Ownership Association. The United Railroads insists that no work be done by the Municipal Railroad under the terms of the proposed agreement until the result of the election shall be known.

New Operating Proposal in Norfolk.—The Virginia Railway & Power Company, Richmond, Va., has submitted to the Board of Aldermen of Norfolk, Va., a proposal for the complete rearrangement of its lines in that city and their operation under new franchise provisions. The plan contemplates making the gage of all tracks uniform, the issuance of universal transfers, the abolition of 3-cent fares and the sale of tickets for 2½ cents on certain lines at specified hours. It also provides for the sale of six tickets for a quarter on cars and at fixed stations. The proposal has been referred by the Aldermen to the finance committee.

An interesting feature of the proposal is the one that provides for a graduated tax on gross earnings in lieu of the multifarious taxes now paid by the company.

Seattle Condemnation Case to Supreme Court.—Argument will be heard before the Supreme Court of the State of Washington on May 12, 1913, to determine whether the city of Seattle has the right to condemn the Seattle, Renton & Southern Railway and to operate it as a municipal street railway. It is stated that this is the first time the particular questions at issue in this case have ever been raised. At the trial before the lower court Judge Gilliam held the city had a right to maintain the action and to condemn the property but intimated he would like to have the Supreme Court pass upon the case. Therefore the writ was asked for, and in the event that the lower court is upheld it will be merely a matter for the jury to settle the question of damages.

Review of Progress of Springfield (Mass.) Street Railway.—The *Springfield News* of March 11, 1913, contained a review of the progress of the Springfield (Mass.) Street Railway. The *News* said that there was no better illustration of the growth of Springfield during the last thirty-three years than the remarkable changes that have taken place in the Springfield Street Railway during that period. The history of the company was briefly reviewed from the beginning in 1868 through the absorption of the system by the New York, New Haven & Hartford Railroad. Mention was made in particular of the improvements carried out under the present management. The article was accompanied by a portrait of Edgar J. Dickson, manager of the company.

East Boston Tunnel Tolls Bill Declared Unconstitutional.—Attorney-General Swift of Massachusetts has sent an opinion to the House of Representatives at its request regarding the constitutionality of the Giblin bill providing that the city of Boston may assume payment of tolls for the use of the East Boston tunnel. The opinion states that previous decisions of the Supreme Court and former Attorney-Generals have well established that any legislation which affects or impairs the security afforded by the collection of the tolls as required by the bill to the holders of the bonds to meet the principal and interest for which such tolls are pledged would clearly be unconstitutional, and that this would be true notwithstanding the fact that some other form of security was substituted therefor.

Plans of the St. Louis & Western Traction Company.—James D. Houseman, president of the St. Louis & Western Traction Company, St. Louis, Mo., is reported to have an option to purchase or lease the property of the St. Louis & Hannibal Railroad. The St. Louis & Western Railroad is projected from St. Louis to Wentzville. The latter city is 2½ miles distant from Gilmore, the present southern terminus of the St. Louis & Hannibal Railroad. Mr. Houseman and his associates plan to build between Wentzville and Gilmore so as to connect the St. Louis & Western Traction Company's line with the St. Louis & Hannibal Railroad and to equip the latter for operation by electricity. The St. Louis & Western Traction Company has graded its line as far as Kirkwood. It proposes to begin active work of construction shortly and to complete the line to Kirkwood by Aug. 1. The road is to be operated with power obtained from the new Mississippi River development at Keokuk.

McKinley Corn-Growing Contest.—W. B. McKinley, president of the Illinois Traction System, Peoria, Ill., has decided to repeat his offer made a year ago of a series of prizes for boys making the best showing in a corn-growing contest. Thirty-five prizes will be awarded to the members of the boys' corn clubs of Champaign, Coles, De Witt, Douglas, Platt, Moultrie, Macon and Shelby Counties. The boy who makes the best record in the corn-growing contest will be taken to New York, Philadelphia, Washington and Niagara Falls, with all expenses paid. To one boy in each of the eight counties who makes the best record there will be afforded a trip to Washington, D. C., and return. To the eight boys who make the second best record there will be afforded a trip to St. Louis and return. To the eight boys who make the third best record there will be afforded a trip to the University of Illinois. Any boy between the ages of ten and eighteen is eligible. Entries close May 15.

Shore Line Headquarters Established at Norwich.—It has been decided to establish the headquarters offices of the Shore Line Electric Railway, otherwise known as the Plant system, of eastern Connecticut at Norwich, Conn. With the probable exception of the lines west of the Connecticut River, which are operated from Saybrook, Conn., the main offices of the principal electric railways east of the river will be at Norwich, and the general administration of the system will be conducted at the latter point. Simultaneously with the taking over of the lines leased by the Plant system from the New York, New Haven & Hartford Railroad, the Norwich & Westerly Traction Company, the Connecticut & Westerly Traction Company and the Pawcatuck Valley Street Railway Company are to be turned over to the Shore Line Electric Railway Company. Arrangements have been made with the New York, New Haven & Hartford Railroad for the use of terminal facilities adjoining its new passenger station in Westerly, R. I. A bill validating the merger of the Plant lines, some of which were taken over under foreclosure, is pending in the Rhode Island Legislature.

Report Presented on Montreal Traffic.—John P. Fox, who has been engaged by one of the Montreal papers to inquire into the local electric railway situation in that city, has made a preliminary report in which he recommends the abolition of the cross seats, the removal of the heavy partitions between the rear platform and the body of the car, the installation of sliding or folding doors at the steps of all cars to protect against dangerous overcrowding of the rear platform, the scrapping of single-truck cars or their operation in pairs or connected together after the Boston model, the operation of every car available for service, the double-tracking of St. James Street and of Notre Dame Street and the provision of a reserve of cars near the center of the city for rush-hour needs. Mr. Fox thinks that a new type of double-truck car is needed in Montreal. The latest Montreal cars have seats for forty passengers, while a lighter type of car used in Pittsburgh has seats for sixty-seven passengers. Double-deck cars seating from ninety to a hundred passengers could be operated without difficulty on most of the important lines in Montreal, according to Mr. Fox, who regards this type of car as worthy of consideration.

To Test Automatic Stops.—The New York, New Haven & Hartford Railroad is preparing to experiment with two of the many automatic stops that were submitted to the company in response to the offer of \$10,000 made by President C. S. Mellen for one that would meet the requirements of the peculiar conditions governing the operation of a railway system such as the New York, New Haven & Hartford Railroad. Under the conditions of the competition the company agreed to assist a competitor by contributions of money or use of tracks, or both, provided his device appeared, in the judgment of C. H. Morrison, signal engineer, to have sufficient merit or promise to justify more extended consideration. Should a device be accepted and the prize awarded, the patent remains the property of the competitor, the company making the sole reservation of a right of use on all its lines without further payment. The device must have the approval of the Interstate Commerce Commission, the Railroad Commission of Massachusetts and the Public Utilities Commissioners of Connecticut, and must be adopted for general use by the Pennsylvania Railroad, the New York Central & Hudson River Railroad or the New York, New Haven & Hartford Railroad within the year 1913, 1914 or 1915.

Decision in Seattle Franchise Case.—The Washington State Supreme Court has affirmed the decision of the Superior Court of King County holding void the section of the Seattle city charter which purports to give to the voters the right, by initiative and referendum, to grant or regulate franchises or to set them aside. The electors under this section voted in favor of an amendment of the franchise previously granted to the Puget Sound Traction, Light & Power Company to provide that the right to build extensions should be exercised only under certain conditions named in the amendment. The company objected particularly to the provision which would permit the city to take over the property of the company at any time at its physical valuation, without any allowance for the franchise. The

city contended that the Gandy act of 1911, authorizing cities to legislate by the initiative and referendum, gives the voters all the powers heretofore held by the City Council. The Supreme Court holds "that the power to grant franchises is a sovereign right. It may be delegated by the State, but it is not within the powers of cities unless expressly delegated by the State." This sovereign power, it is stated, has been granted to city councils, but never to the people by direct vote, and the right to pass or cancel or regulate franchises by direct vote, cannot be acquired unless specifically given by the Legislature.

Growth of Street Car Habit in Newark.—The *Newark*, which is published monthly by the Free Public Library of Newark, N. J., devoted its entire issue for February, 1913, to a complete exposition of the transportation problem in Newark and a careful statement of a proposed solution of the problem made by J. L. O'Toole, of the publicity department of the Public Service Corporation of New Jersey, at the request of J. C. Dana, librarian of the city. The cover of the *Newark* was given over to a summary showing the growth of street railway traffic in Newark since 1893. Comparisons were made between 1893, 1903 and 1912. In twenty years the population of Newark has increased 85 per cent, while rides in street cars have increased 330 per cent. During this period the "street car habit grew 233 per cent." The article is illustrated with a halftone of the exterior of the proposed terminal building for the Public Service Railway in Newark, which was the subject of an article in the *ELECTRIC RAILWAY JOURNAL* of Feb. 8, 1913, page 246, and with line cuts and reproductions from wash drawings showing details of the proposed traffic plan. Maps were presented of the center of Newark showing track changes suggested for carrying out the terminal plan. There was also a map showing track extensions under consideration for the near future. Advantage was taken by Mr. Dana of the opportunity to present a list of the publications in the Newark Public Library dealing with the rapid transit matters and with traffic conditions. These he arranged under the headings "Rapid Transit in Cities," "Magazine Articles on Rapid Transit in Cities" and "Books, Pamphlets and Maps."

LEGISLATION AFFECTING ELECTRIC RAILWAYS

IDAHO

The Senate has passed the bill to create a public utilities commission in Idaho and the measure is now before the Governor for signature. The workmen's compensation bill introduced by Senators Fairchild, Defenbach and Johnson has been killed in the Senate.

ILLINOIS

Representative Hollenbeck has introduced into the Illinois Legislature House bill No. 186, which provides for special taxation up to a legal limit for payment of bonds for electric light and street railway systems and other improvements where a city or village is about to forfeit such improvement through inability to meet payments due. Representative Rinehart has introduced House bill No. 201, a publicity franchise law requiring public hearing and advertisement before the confirmation of utility franchises. Senator Harris has introduced Senate bill No. 236, one of the Chicago charter measures to provide a public utilities commission for the city of Chicago.

OHIO

On March 12 a conference took place between Governor Cox and Mayor Newton D. Baker of Cleveland as to whether the proposed administration public service bill shall govern municipally owned utilities and those operating within municipalities. Mr. Baker has argued that such utilities should be exempted from the operation of the law, while the Governor has taken the opposite stand. It has been agreed that the bill shall be drawn to give the Public Service Commission the right to regulate such utilities, with the reservation of the rights granted municipalities by the home rule amendment to the constitution, and that the courts shall be called upon to fix these rights. This bill will require the value of the physical property of all public service properties to be ascertained as a basis on which to fix proper rates for service.

The House has passed to second reading the Bigelow bill to revoke fifty-year franchises held by street railway companies.

PENNSYLVANIA

The introduction of new measures into the House ended with the session of March 17, when 312 bills were presented, bringing the total number for the House alone up to 1802, thus establishing a record. The total for both Senate and House is more than 2000. Among the bills presented March 17 was one by Martin of Dauphin, prohibiting street railways from issuing passes except to officers and employees. The same representative also introduced a measure authorizing the State Highway Department to construct a bridge across the Susquehanna River at Middletown, at a cost not to exceed \$200,000. Should this bill become a law it would probably mean the construction of another electric railway connecting Middletown with the west shore of the river, which is about 1 mile wide at this point. Among the revenue-raising bills introduced is one taxing the bonds of corporations 4 mills, which would increase the income of the State about \$10,000,000 annually. At present the corporations are required to pay such a tax only upon bonds of persons residing in the State, and there is no definite means of ascertaining the identity of bondholders. Both the State administration and Republican State Convention "blue-sky" bills have been introduced. The former embraces all such companies, except public utilities companies, as are included in the public utilities commission bill, while the latter embraces all stock and investment companies. The bill licensing the sale of liquors on dining cars passed the House March 17, after having been placed on the calendar notwithstanding a negative report from committee.

As a result of the joint hearing for the public extended by the Senate and House committees on the public utilities bills on March 18 important amendments have been made to the State administration bill, which is now expected to receive the support of Republicans and Progressives, the Democrats probably voting for their own measure. The vital amendments made to the State administration measure were those giving the proposed public utilities commission power to require full publicity of stock issues, to have corporations make tax returns on the value of their physical property rather than the value of their securities, and to empower the commission to aid the abolition of grade crossings and the smoke nuisance.

Another amendment was that covering the relation of municipalities to public utilities companies. The amendment provides that cities may have the right to engage in public utility service and for this right not be compelled to seek the permission of the proposed commission, but where a private corporation is doing business before the city can enter into competition a certificate must be issued by the commission stating that service by the municipality is required for public convenience. If the commission decides against the city the latter may purchase the control and property of the existing corporation at a price set by the commission.

Among the speakers for and against the bill were W. U. Hensel, former Attorney-General, who appeared as the representative of a number of corporate interests; Henry G. Wasson, Republican state chairman, and Attorney-General Bell, who appeared for the measure; E. W. Burdett, for the gas and electric light interests, and George Stuart Patterson, counsel for the Pennsylvania Railroad. Mr. Hensel urged the members of the committee to see to it that the commission received discretionary rather than mandatory powers, and called attention to the few complaints against the present commission, whose powers are limited to recommendations. Mr. Patterson favored the extension of the term of the commissioners from five to eight or ten years on the ground that the longer term would prevent frequent changes in the personnel of the commission through changes in the fortunes of the political parties.

UTAH

The Senate has voted to kill the bill to provide a public service commission. The House had previously voted against a similar measure. The action by the Senate obviates all possibility of such a commission being created at this session.

Financial and Corporate

Stock and Money Markets

March 19, 1913.

The general level of the New York market as measured by the average of fifty issues dropped to-day to a new low level for the year. The dealings, however, expanded to more than twice the volume of the previous day's transactions. Interborough-Metropolitan preferred lost a full point despite the news of the signing of the subway operation contracts. New Haven, on the other hand, made a net gain of 1½ points. Rates in the money market to-day were: Call, 2½@5 per cent; sixty to ninety days, 5¼@6 per cent; four and five months, 5½@5¾ per cent; six months, 5¼@5½ per cent.

The Philadelphia stock market to-day was broad and quite active. The demand for bonds was good.

The Chicago stock market was broad, but the volume of sales was small. There was little demand for bonds.

In Boston the railroad and electric railway issues were more in evidence in the trading than they have been for some time past. The bulk of the bond business was in American Telephone & Telegraph 4's.

The Baltimore stock market to-day was narrow and dull. The demand for bonds was fair.

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

	Mar. 12.	Mar. 19.
American Brake Shoe & Foundry (common).....	90¼	90¼
American Brake Shoe & Foundry (preferred).....	131	131
American Cities Company (common).....	47½	44
American Cities Company (preferred).....	76¾	a76¾
American Light & Traction Company (common).....	370	350
American Light & Traction Company (preferred).....	107	106
American Railways Company.....	395¾	..
Aurora, Elgin & Chicago Railroad (common).....	44½	44
Aurora, Elgin & Chicago Railroad (preferred).....	87	87
Boston Elevated Railway.....	108¼	107
Boston Suburban Electric Companies (common).....	7½	7½
Boston Suburban Electric Companies (preferred).....	63	a66
Boston & Worcester Electric Companies (common).....	7¼	7½
Boston & Worcester Electric Companies (preferred).....	43	43
Brooklyn Rapid Transit Company.....	87	87
Capital Traction Company, Washington.....	121	120
Chicago City Railways.....	150	150
Chicago Elevated Railways (common).....	25	*25
Chicago Elevated Railways (preferred).....	88	*88
Chicago Railways, pteptg., ct. 1.....	90	90
Chicago Railways, pteptg., ct. 2.....	22¼	22¼
Chicago Railways, pteptg., ct. 3.....	6¾	6¾
Chicago Railways, pteptg., ct. 4.....	3½	3½
Cincinnati Street Railway.....	111	112
Cleveland, Southwestern & Columbus Ry. (common).....	a5½	*5½
Cleveland, Southwestern & Columbus Ry. (preferred).....	a30	*30
Cleveland Railway.....	102¾	103½
Columbus Railway & Light Company.....	18	18
Columbus Railway (common).....	69½	a69½
Columbus Railway (preferred).....	82½	82½
Denver & Northwestern Railway.....	108	*108
Detroit United Railway.....	85	a80
General Electric Company.....	138	136
Georgia Railway & Electric Company (common).....	120	121
Georgia Railway & Electric Company (preferred).....	83¾	a83¾
Interborough Metropolitan Company (common).....	165¾	17¼
Interborough Metropolitan Company (preferred).....	58	58
International Traction Company (common).....	35	*35
International Traction Company (preferred).....	a95	*95
Kansas City Railway & Light Company (common).....	15	15
Kansas City Railway & Light Company (preferred).....	30	30
Lake Shore Electric Railway (common).....	6½	*6½
Lake Shore Electric Railway (1st preferred).....	a91	*91
Lake Shore Electric Railway (2d preferred).....	a25½	*25½
Manhattan Railway.....	130	127¾
Massachusetts Electric Companies (common).....	16½	16½
Massachusetts Electric Companies (preferred).....	74¾	74½
Milwaukee Electric Railway & Light Co. (preferred).....	100	*100
Norfolk Railway & Light Company.....	25¾	*25¾
North American Company.....	77	77
Northern Ohio Light & Traction Company (common).....	80	72½
Northern Ohio Light & Traction Company (preferred).....	105	a105
Philadelphia Company, Pittsburgh (common).....	45¾	45
Philadelphia Company, Pittsburgh (preferred).....	40	40
Philadelphia Rapid Transit Company.....	25¾	25¾
Portland Railway, Light & Power Company.....	67	*67
Public Service Corporation.....	115	115
Third Avenue Railway, New York.....	35½	34
Toledo Railways & Light Company.....	2½	2½
Twin City Rapid Transit Co., Minneapolis (common).....	104	103
Union Traction Company of Indiana (common).....	4½	*4½
Union Traction Company of Indiana (1st preferred).....	81	*81
Union Traction Company of Indiana (2d preferred).....	34	*34
United Rys. & Electric Company (Baltimore).....	23½	23
United Rys. Inv. Company (common).....	26	25
United Rys. Inv. Company (preferred).....	49	47
Virginia Railway & Power Company (common).....	55	51¾
Virginia Railway & Power Company (preferred).....	89	89
Washington Ry. & Electric Company (common).....	84½	87½
Washington Ry. & Electric Company (preferred).....	87¾	88¼
West End Street Railway, Boston (common).....	78	76½
West End Street Railway, Boston (preferred).....	95	a95
Westinghouse Elec. & Mfg. Company.....	68½	62
Westinghouse Elec. & Mfg. Company (1st preferred).....	116	117

*Last sale. a Asked.

ANNUAL REPORTS

Underground Electric Railways, Ltd.

The revenue account of the Underground Electric Railways, Ltd., London, Eng., for the half year ended Dec. 31, 1912, compared with the half year ended Dec. 31, 1911, follows:

	1912.	1911.
Receipts.		
Income from investments, etc.....	£279,220	£110,631
Net, power house.....		45,918
Total receipts	£279,220	£156,549
Expenditures.		
General expenses	£3,889	£3,281
Commission, discount and expense.....		870
Interest on bonds and debentures.....	79,526	97,764
Interest on income bonds.....	a195,485	b52,333
Payment under guaranty on Metropolitan District Railway assented extended preferred stock.....		619
Rents, etc.		
Total expenditures	£278,900	£154,867
Balance, surplus	£320	£1,682

a At rate of 6 per cent per annum. b At rate of 2 per cent per annum.

At the half-yearly meeting of the company Sir Edgar Speyer, Bart., said in part:

"The revenue account shows total receipts of £279,220, as against £156,549 for the corresponding half-year of 1911. The latter item, however, includes £45,918 income from the operation of the power house then owned by your company. Deducting this item there remains an increase of £168,589, of which £154,540 is due to our holdings in London General Omnibus ordinary shares and Associated Equipment Company shares acquired in 1912. This increase enables your company to pay for the first time the full half-year's interest (3 per cent on the 6 per cent income bonds of 1948, comparing with 1 per cent [2 per cent per annum], a year ago).

"The total net revenue available for distribution among the income bondholders for the whole year of 1912 was £328,251, as compared with £93,511 in 1911, and the rate of interest paid on the income bonds in the two years was 5 per cent and 1¾ per cent respectively.

"The fear has been expressed in some quarters that the concentration of the transport facilities of London will tend toward an increase in fares and a reduction in service. My reply to this suggestion is that a true safeguard against any possible abuse is to be found in the fact that the interests of the shareholders and the traveling public are identical. It is only by giving a thoroughly satisfactory service at reasonable fares that we can hope to retain the good will of the public and to make this great undertaking a success.

"The total capital of all the companies is £48,550,000, divided as follows: railways, £39,700,000; tramways, £5,700,000; omnibuses, £3,150,000. The total mileage is 520, made up of 60 miles of underground railways, 112 miles of tramways and 348 miles of omnibus routes.

"For the calendar year 1912 the combined undertakings carried a total of 893,000,000 passengers, of which the railways carried 247,000,000, tramways 153,000,000 and the omnibuses 493,000,000.

"We cannot hope for much better showings on the City & South London Railway until the tunnels have been enlarged to the size of our other tube railways, thus greatly increasing its capacity and efficiency. This will take at least two years after the necessary Parliamentary powers have been obtained.

"The Central London Railway is benefiting from its Liverpool Street extension, and when the Ealing extension is opened further increases in earnings should be shown. These factors, together with economies, should substantially reduce the apparent deficiency upon the guaranteed stock.

"The fusion of the interests of the London United Tramways and Metropolitan Electric Tramways, and the motor bus service which will be run in conjunction with them, should prove a source of considerable profit to the London & Suburban Traction Company, Ltd.

"In view of the considerable increase of the fleet of the London General Omnibus Company and the inauguration of new routes, which it takes some time to develop, it is natural that the earnings per bus in the interim should show a decrease, but there is nothing discouraging in this. On the contrary, the business stands on a very sound basis.

"The London Electric Railway bill provides for a physical junction (a) with the City & South London Railway at Euston, so as to permit through train service from the North to the South of London via the City; (b) with the London & Southwestern Railway at Hammersmith for through train service to Richmond. The Central London Railway bill provides for an extension from Shepherd's Bush to Gunnersbury, through a thickly populated district. The District Railway bill provides for widening a section of the Putney line, which will assist in dealing with its rapidly growing traffic, and for agreements with the Wimbeldon & Sutton Railway.

"Your company during the last six months sold £250,000 of London Electric preferred stock, £9,460 of District guaranteed stock, £6,000 of District assented first preferred stock and £20,000 consols.

"We acquired 15,000 London United Tramways preferred shares, 50,000 Associated Equipment Company shares, £14,574 London General Omnibus ordinary stock and £23,670 London Electric Railway preferred stock in exchange for 2,367 Edgware & Hampstead shares.

"The Associated Equipment Company, whose £500,000 share capital is owned by your company, owns large works at Walthamstow. It also owns the Metropolitan Steam Omnibus Company, which is now running a fleet of 100 modern petrol buses. Its revenue should prove a source of continuing profit."

Long Island Railroad

For the fiscal year ended Dec. 31, 1912, the Long Island Railroad Company's gross revenue from operation of railroad lines was greater by \$668,905.08, or 6.36 per cent, than in 1911, the increase in gross being attributed to "general growth on the island and increase in both passenger and freight traffic." This increase was, however, offset to some extent by further loss in ferry earnings. The loss amounted to \$54,142.10, as compared with \$132,833 in the previous year, and was due to the increased facilities furnished by the electric railways which operate over the Queensboro Bridge and to the increase in the use of the tunnels to the Pennsylvania station at Seventh Avenue and Thirty-third Street, New York. The passenger revenue increased 5.48 per cent and miscellaneous revenue 5.59 per cent.

On an average more than 100,000 passengers were carried daily during the year, the total number of riders being 37,319,812, which is 3,452,584, or 10.19 per cent, more passengers than were handled in 1911. The passenger mileage increased 43,354,278, or 8.53 per cent, while the passenger train mileage decreased 12,496, or 2.22 per cent. These figures indicate that the largest passenger business in the history of the Long Island Railroad was done in 1912.

Ralph Peters, president of the company, commenting on the results of the company for the year, said:

"The statistics, particularly as they relate to passenger traffic, indicate that your company is gradually getting on a steady basis and overcoming some of the expensive conditions forced upon the operating departments by the reconstruction of the road, change of terminals, etc.

"The line to Whitestone Landing was finished and put in operation in September, and new substations were completed at Wreck Lead, Cedarhurst and Floral Park. Material for substations, third-rail, etc., is on the ground for the line to Port Washington to be completed by September, 1913, and additional machinery was placed in existing substations during the year."

The report includes two maps, one showing the Long Island Railroad system and the Montauk Steamboat Company's lines and the other showing the western portion of the island. On the latter the lines which are operated electrically are shown in red. They represent 188 miles of track.

The new station of the company at Jamaica was opened for service on March 9, 1913. The work in connection with the new terminal and the elimination of grade crossings involved in the so-called "Jamaica improvement" has been carried on for several years, and while the service will be greatly improved at once, the completion of the work is expected to increase further its efficiency and enable the company to proceed with the electrification of the Montauk division between Jamaica and Babylon.

Change in Control of Denver & Northwestern Railway

Marsden J. Perry, Providence, president of the Denver & Northwestern Railway, has disposed of the 1600 shares of stock which he held of the Denver & Northwestern Railway, which in May, 1902, purchased the capital stock of the Denver City Tramway. Mr. Perry is said to have received \$2,500,000 for his interest, or more than \$156 a share. The purchasers are a Denver syndicate composed of Charles Boettcher, A. V. Hunter, S. M. Perry, Horace W. Bennett, Julius A. Miers, Thomas Keely, J. C. Mitchell and W. G. Evans, some of whom are directors of the Denver City Tramway. The board of directors of the Denver & Northwestern Railway will be increased from nine members to thirteen by the addition of A. V. Hunter, president of the First National Bank; Horace Bennett, capitalist; Claude K. Boettcher, of Boettcher, Porter & Company, and one other who has not yet been decided upon. Other directors are W. G. Evans, S. M. Perry, Gerald Hughes, Thomas Keely, F. G. Moffat, Rodney Curtis and J. A. Beeler, Denver; B. A. Jackson, Providence, R. I., and W. L. Bull, New York, N. Y. The executive committee of the company will consist of W. G. Evans, president; Gerald Hughes, S. M. Perry, Claude K. Boettcher and Horace W. Bennett. Mr. Perry owned 1600 of the 6000 shares of capital stock of the company outstanding, while some 2400 shares are held in the East by B. A. Jackson and others, representing Clark, Dodge & Company, New York, N. Y.; E. W. Clark & Company, Philadelphia, Pa., and others. The remaining 2000 shares are held largely in Denver. Boettcher, Porter & Company, Denver, issued a statement in part as follows recently in regard to the completion of the transaction involving the Perry interest:

"For some time past we have endeavored to bring back to Denver a controlling ownership in the securities of the Denver City Tramway, a majority of which went to Providence, New York and other interests some years ago. We are prompted to this effort by the belief that a utility so closely identified with the welfare and development of the city should be financially, as it is physically, strictly a Denver property. As the outcome of our negotiations we have purchased for ourselves or our associates the Denver & Northwestern Railway holdings of Marsden J. Perry, Providence, whose interest amounted to about one-quarter of the ownership of the tramway company. Though the other Eastern interests are unwilling to sell, they have joined with us in plans that we have formed for the future of the property."

American Light & Traction Company, New York, N. Y.—The stockholders of the American Light & Traction Company have approved the plan to increase the common stock of the company from \$15,000,000 to \$40,000,000. Reference to this proposed increase in the common stock of the company was made in the *ELECTRIC RAILWAY JOURNAL* of Jan. 18, 1913, page 130.

Bowling Green (Ky.) Street Railway.—J. McKenzie Ross, judge of the Warren Circuit Court, of Bowling Green, Ky., has named Master Commissioner William R. Speck receiver of the Bowling Green Street Railway.

Brantford (Ont.) Street Railway.—It has been announced that the Canadian General Electric Company, which held \$125,000 of first mortgage bonds of the Brantford Street Railway, has agreed to assume control of the property and operate it for a period of two years.

Fries Manufacturing & Power Company, Winston-Salem, N. C.—It is reported that the Southern Power Company, of which J. B. Duke, New York, N. Y., is president, has arranged to take over the property of the Fries Manufacturing & Power Company. H. E. Fries, president of the Fries Manufacturing & Power Company, has issued a statement as follows: "Certain changes have been made in the holdings of the capital stock of the Fries Manufacturing & Power Company, but no changes in the management or organization will be made for the present."

Geneva & Auburn Railway, Seneca Falls, N. Y.—The property of the Geneva & Auburn Railway was sold under foreclosure at Waterloo on March 14, 1913, to representatives of the West End Trust Company, Philadelphia, Pa., trustee, representing the bondholders.

Halifax (N. S.) Electric Tramway, Ltd.—Two bills have been introduced into the House and Assembly regarding the Halifax Electric Tramway, Ltd. One measure, backed by the Halifax City Council, proposes that the city acquire the property and operate it as a municipal concern, paying \$170 per share or fixing the price by arbitration. The other measure provides for the organization of the Halifax Tramways & Power Company, Ltd., to merge the Halifax Electric Tramway, Ltd., and the Nova Scotia Company.

Highland Park & Lake Burien Railroad, Seattle, Wash.—The property of the Highland Park & Lake Burien Railroad has been sold at sheriff's sale for \$12,000 to the McQuaid & Moore, Seattle. The road was promoted by persons who owned property near Lake Burien and to the south of West Seattle. It was completed from Spokane Avenue and West Waterway to Lake Burien and the first car was operated on July 1, 1912. For four months an intermittent service was maintained and then a slide covered the track for a mile and operation was abandoned.

Ocean Shore Railroad, San Francisco, Cal.—The Ocean Shore Railroad has applied to the Railroad Commission of California for authority to issue \$700,000 of 6 per cent bonds, maturing in 1916. It is stated in the application that the capital to be thus secured is to be used to purchase land for right-of-way purposes upon which the Ocean Shore Railroad at present has only a leasehold, and to purchase property for right-of-way purposes, purchase equipment, comply with possible franchise requirements in San Francisco and make preliminary changes. The application states that these improvements will cost \$250,000. The company asks authority to pledge the \$700,000 of bonds as collateral security for a loan of \$250,000, to be negotiated with the Union Trust Company, San Francisco.

Oskaloosa Traction & Light Company, Oskaloosa, Ia.—W. B. McKinley, president of the Illinois Traction System, Champaign, Ill., is reported to have secured an option on the property of the Oskaloosa Traction & Light Company and the Oskaloosa & Buxton Electric Railway.

St. John (N. B.) Railway.—It is said that the offer of John R. Graham, president of the Bangor Railway & Electric Company, Bangor, Me., and Henry W. Cushman, president of the Merrill Trust Company, Bangor, to purchase the \$800,000 of stock of the St. John Railway at \$150 a share has been rejected. According to the *St. John Daily Telegraph*, "the refusal of the committee which had the offer under consideration is apparently by no means the end of the matter, as the offer comes from interests connected with the New Brunswick Hydroelectric Company."

Stockton Terminal & Eastern Railroad, Stockton, Cal.—The Railroad Commission of California has taken under advisement the application of the Stockton Terminal & Eastern Railroad for permission to issue \$378,000 of bonds to provide funds for extensions. The company is now operating 8 miles of line between Stockton and Bellota.

Tri-State Railway & Electric Company, East Liverpool, Ohio.—Judge Day of the federal court in Cleveland, Ohio, on March 18 appointed R. E. Richards, Steubenville, Ohio, and W. R. W. Griffin, general manager of the company, receivers of the Tri-State Railway & Electric Company. This receivership will include the operation of the properties of the Steubenville & East Liverpool Railway & Light Company and the East Liverpool Traction & Light Company, which are leased by the Tri-State Railway & Electric Company. The receivership will not affect the operation of other lighting and railway companies in Pennsylvania and West Virginia which are controlled by the Tri-State Railway & Electric Company through stock ownership.

Winchester & Washington City Railway, Winchester, Va.—The property of the Cacapon Power Company has been purchased by Lewis F. Cooper, president of the Winchester & Washington City Railway. The purchase includes all the holdings of the Cacapon Power Company, represented in part by an electric water-power plant located on the Cacapon River, about 3½ miles west of Berkeley Springs, a steam auxiliary plant located in Berkeley Springs and other property and real estate in connection therewith. The property of the Citizens' Electric Company, Charleston, W. Va., has also been purchased by the same interests in behalf of the Winchester & Washington City Railway.

Dividends Declared

Cleveland (Ohio) Railway, quarterly, 1½ per cent.
 Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred; quarterly, 1¼ per cent, common.
 El Paso (Tex.) Electric Company, 3½ per cent, common.
 Halifax (N. S.) Electric Tramway, Ltd., quarterly, 2 per cent.
 Illinois Traction Company, Champaign, Ill., quarterly, 1½ per cent, preferred.
 Louisville (Ky.) Traction Company, 2½ per cent, preferred; quarterly, 1 per cent, common.
 Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.
 New York State Railways, Syracuse, N. Y., 1¼ per cent, preferred; 1½ per cent, common.
 Philadelphia Company, Pittsburgh, Pa., 3 per cent, cumulative preferred; quarterly, 1¾ per cent, common.
 St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., quarterly, 1¼ per cent, preferred.
 Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., quarterly, 1¼ per cent, preferred.
 Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent preferred; quarterly, 1½ per cent, common.
 United Light & Railways Company, Grand Rapids, Mich., quarterly, ¾ of 1 per cent, second preferred; quarterly, 1½ per cent, first preferred.
 West End Street Railway Company, Boston, Mass., \$1.75, common.
 West India Electric Company, Ltd., Kingston, Jamaica, quarterly 1¼ per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE.							
Period.		Gross Earnings.	Operating Expenses.	Net Earnings.	Fixed Charges.	Net Surplus.	
1m.,	Jan.	'13	\$58,793	*\$28,933	\$29,860	\$17,340	\$12,520
1 "	"	'12	53,448	*25,993	27,455	15,762	11,693
12 "	"	'13	715,373	*323,683	391,690	201,336	190,354
12 "	"	'12	604,386	*282,597	321,789	158,230	163,559

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.							
1m.,	Jan.	'13	\$95,633	*\$59,241	\$36,392	\$24,399	\$11,993
1 "	"	'12	81,004	*48,091	32,913	21,269	11,644
12 "	"	'13	1,079,302	*645,765	433,537	269,159	164,378
12 "	"	'12	950,943	*559,029	391,914	241,870	150,044

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.							
1m.,	Jan.,	'13	\$618,105	*\$337,259	\$280,846	\$137,495	\$143,351
1 "	"	'12	535,906	*302,296	233,610	115,652	117,958
12 "	"	'13	6,472,118	*3,753,259	2,718,859	1,524,415	1,194,444
12 "	"	'12	5,582,431	*3,209,163	2,373,258	1,289,956	1,083,302

EAST ST. LOUIS & SUBURBAN RAILWAY, EAST ST. LOUIS, ILL.							
1m.,	Jan.,	'13	\$213,214	*\$122,498	\$90,716	\$48,356	\$42,360
1 "	"	'12	191,036	*107,954	83,882	48,055	35,027
12 "	"	'13	2,474,630	*1,368,113	1,106,517	578,772	527,745
12 "	"	'12	2,281,459	*1,275,295	1,006,164	550,345	455,819

GRAND RAPIDS (MICH.) RAILWAY.							
1m.,	Jan.,	'13	\$103,986	*\$59,354	\$44,632	\$15,727	\$29,895
1 "	"	'12	97,448	*54,660	42,788	14,790	27,998
12 "	"	'13	1,240,126	*704,924	535,202	175,171	360,031
12 "	"	'12	1,174,773	*663,903	510,870	197,075	331,795

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.							
1m.,	Jan.,	'13	\$185,999	*\$110,876	\$75,123	\$36,994	\$38,129
1 "	"	'12	166,135	*99,322	66,813	34,722	32,091
12 "	"	'13	2,094,855	*1,200,498	894,357	437,084	457,273
12 "	"	'12	1,968,015	*1,131,899	836,116	405,914	430,202

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY.							
1m.,	Feb.,	'13	\$1,775,158	\$1,104,541	\$670,617	\$767,505	\$96,888
1 "	"	'12	531,213	*272,961	600,872	739,442	138,569
8 "	"	'13	15,703,350	9,419,446	6,283,903	6,097,427	186,477
8 "	"	'12	14,878,288	9,145,835	5,732,453	5,910,088	177,634

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.							
1m.,	Jan.	'13	\$553,598	*\$270,209	\$283,389	\$153,021	\$130,368
1 "	"	'12	531,213	*272,961	258,252	136,695	121,557
12 "	"	'13	6,664,693	*3,326,159	3,338,534	1,777,317	1,561,217
12 "	"	'12	6,356,292	*3,072,244	3,284,048	1,523,467	1,760,581

UNION RAILWAY, GAS & ELECTRIC COMPANY, ROCKFORD, ILL.							
1m.,	Jan.	'13	\$419,759	*\$237,388	\$182,371	\$93,288	\$89,083
1 "	"	'12	313,721	*184,984	128,737	65,583	63,154
12 "	"	'13	4,098,172	*2,380,305	1,717,867	991,852	726,015
12 "	"	'12	3,227,450	*1,852,263	1,375,187	750,355	624,832

*Includes taxes.

Traffic and Transportation

Regulations Restricting the Dimensions of Baggage

The Interstate Commerce Commission has summarized as follows its conclusions in the matter of investigation and suspension of certain new rules and regulations restricting the dimensions of trunks and other articles handled as baggage by carriers operating throughout the United States, and has entered an order in accordance with these conclusions:

"1. Carriers may reasonably provide for an extra charge for the transportation of pieces of personal or sample baggage, excepting whips in cases, having dimension or dimensions exceeding 45 in., such charge per inch in excess of 45 in. not to exceed the charge for 5 lb. of excess baggage.

"2. Respondents must provide for checking as baggage whips in flexible cases not exceeding 90 in. in length, or 12 in. in diameter at the base, or 100 lb. in weight.

"3. Carriers may reasonably provide that a piece of baggage exceeding 72 in. in any dimension will not be accepted for checking.

"4. Upon notice of not less than one year carriers may provide that trunks or other rigid containers with more than two bulging sides, or with two bulging sides that are not opposite to each other, will not be accepted for checking as baggage.

"5. Carriers' definition of sample baggage should permit including therein salesmen's catalogs.

"6. Where the charges for excess weight and excess dimensions do not exceed the minimum charge, the single minimum charge shall apply.

"Upon the whole record, we conclude that respondents have justified the proposed rules and regulations to the extent that they are approved of in this report. The suspended rules must be canceled. New rules in harmony with the findings and conclusions herein may be established upon statutory notice to the commission and to the public."

Progress of Safety Campaign in Brooklyn

Reference was made in the ELECTRIC RAILWAY JOURNAL of March 8, 1913, page 442, to the arrangement entered into by the Brooklyn (N. Y.) Rapid Transit Company with the American Museum of Safety for a six months' campaign in the public schools of Brooklyn on the subject of safety in the streets of that borough. The company has since posted in its cars a placard dealing with the subject of safety which reads as follows:

"SAFETY

"In the interests of a safer Brooklyn, the American Museum of Safety, by authority of the Board of Education of the city of New York, is giving lectures on safety and caution to the pupils in the public schools of the borough.

"The children are shown by object lessons the perils of street traffic. They are told how to play and conduct themselves in the street without risk to themselves and others.

"The red and green badge of the American Museum of Safety League (red for danger, green for caution) is a reminder to think of the principles of the league, namely.

"SAFETY ALWAYS

"Illustrated safety stories follow up the classroom talks. A specimen set will be sent to any grown-up for a 2-cent stamp.

"The Brooklyn Rapid Transit Company, solicitous for the safety of the borough's children and grown-ups, is co-operating with the Safety Museum in this children's crusade for safety, caution and self-control.

"The museum's collection of safety and health devices is displayed on the sixth floor of the Engineering Societies Building, 29 West Thirty-ninth Street, New York, free to the public daily (except holidays and Sundays) from 9 a. m. to 5 p. m."

In addition the company is distributing 600,000 copies of an eight-page brochure on the subject of safety copyrighted by the American Museum of Safety. This brochure is entitled "The Little Girl Who Didn't Think." It is illustrated with line cuts which show the right and wrong way to board cars and alight from them, and it brings out clearly

the results likely to happen to children who steal rides on cars or who heedlessly pass behind a car directly in front of a vehicle coming in the opposite direction. The first page of this brochure contains a line cut showing the driver of a delivery wagon and a motorman making every effort to avoid running down a little girl who has thoughtlessly stepped off the curb directly in front of the wagon and the car.

Cars and Service in Milwaukee

R. B. Stearns, vice-president of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., testified before the Railroad Commission of Wisconsin on March 10, 1913, that while the number of cars in operation in four years had been increased more than 25 per cent the actual increase in passengers carried was only 14 per cent. In 1910 the number of cars operated was 396, he explained, while the total number of passengers carried was 88,073,000. In 1913 his estimate, based on the returns of the first two months, is that an average of 537 cars will be operated throughout the year, while the actual passenger traffic will be about 100,000,000. This testimony was presented at a hearing before the commission in which the company had an opportunity to explain why it did not obey the order of the commission on Feb. 4 to increase the number of cars in use on the Eighth Street line. Mr. Stearns testified that the order was not obeyed because of a shortage of cars. He said that part of the order was carried out, as all the south-bound cars recommended by the commission were in actual operation during the rush hours. The number of cars operated north of Grand Avenue from 5.15 p. m. to 6 p. m. could not be increased without crippling other lines. Orders for sixty new cars have been placed by the company. Thirty of these have been delivered, and thirty more are to arrive in July. Mr. Stearns said that trailers were impracticable on the Eighth Avenue line because there is no loop on the line on which to turn the double cars. Every car fit for service was in use. The average number of cars out of service was forty-four, owing to accidents and other causes.

The following statement of cars in service and passengers carried for four years was presented at the hearing:

Year.	Average No. Cars.	Passengers.
1910	396	88,073,000
1911	477	92,206,000
1912	507	96,607,000
1913	537	*100,000,000

*Estimated.

New Transfers in Salt Lake City.—The Utah Light & Railway Company, Salt Lake City, Utah, will shortly adopt a new system of transfers to correct abuses which have grown up under the present system.

Through Service Between Easton and Allentown.—Through electric railway service was established between Easton and Allentown on March 15, 1913, over the lines of the Lehigh Valley Transit Company from Allentown to Bethlehem, and the Easton Transit Company from Bethlehem to Easton. Through cars are run hourly.

Accident Prevention Work at New Albany.—The Louisville & Northern Railway & Lighting Company, New Albany, Ind., has instituted a safety campaign which, it is expected, will aid materially in reducing the number of accidents to passengers and employees. The company has adopted as its keynote "Please Help Us to Make It Safe." Special signs have been installed at dangerous points along the route by the company. Helpful literature is also being distributed periodically to the company's employees and to such of its passengers as are interested in the work.

Four-Car Train of the Monongahela Traction Company.—The Monongahela Valley Traction Company, Fairmont, W. Va., has been operating two-car trains and on one occasion during the past summer when it was necessary to transport a large number of passengers over the line to Fairmont the idea was conceived of operating four cars in a train. All of the cars are equipped with Westinghouse type HL unit-switch control, and the large crowd was transported in one four-car train without interfering

with the regular schedule. Regular three-car train service is now being considered by the operating department.

Plan to Increase Service Between Providence and Fall River.—The Providence, Warren & Bristol Railroad, which is operated by the New York, New Haven & Hartford Railroad between Providence, R. I., and Fall River, Mass., has under consideration a plan to better its service between the cities this summer by increasing the length of its trains. The road is equipped with the overhead trolley system, and heretofore the longest trains have consisted of one motor car and two trailers. A six-car train consisting of two motor cars and four trailers was operated between the cities recently as an experiment. Traffic over the road on Sundays and holidays in summer is very heavy and by running trains of six cars or more it is thought that the necessity of operating double-headers can be overcome.

Complaint Filed with I. C. C. Against Washington Utilities Company.—The Interstate Commerce Commission has served on the Washington (D. C.) Utilities Company a copy of the complaint by the citizens of Falls Church, Va., who seek better rates over the railway between Falls Church and the company's terminal at Twelfth and D Streets, Northwest. The complainants want the railway to desist in its collection of a car ticket or a cash fare of 5 cents for the ride from Arlington Junction, Va., to Twelfth and D Streets. They also want the company to sell the twenty-five-trip family, the fifty-two-trip monthly and the 160-trip quarterly tickets to cover complete trips between the Virginia points and the company's terminal, and want the maximum charge for these tickets fixed at 8 cents, 7 cents and 6 cents respectively. The maximum charge for the single and round trips they want made 10 cents and 20 cents respectively, with such other relief as the commission may deem necessary.

New Service Between Alton and St. Louis.—Arrangements have been concluded between the Alton, Granite & St. Louis Traction Company and the Illinois Traction System by which early in April at least ten of the interurban cars of the former company will each day be delivered to the Illinois Traction System at the junction of the tracks of the two systems in Venice and be run to and from the terminal of the Illinois Traction System at Twelfth Street and Lucas Avenue, St. Louis, Mo. At the same time cars running via East St. Louis will be operated from the west end of the Eads Bridge without transfer at East St. Louis. There will be no change in the present rate of through fare between Alton and St. Louis via either route, but the local fare between Alton and Granite City will be increased 5 cents to harmonize with the through fare, the new rate being still less than the standard rate of 2 cents a mile in Illinois. This change in service will afford those who travel between Alton and St. Louis a choice of two central terminals in St. Louis and a continuous ride between the cities via either route without transfer.

Railway Aids in Community Development.—An illustration of the way in which an interurban railway may aid in community development, even though this improvement takes the form of a highway for horse-drawn and automobile traffic which is more or less competitive as regards the electric railway, is found in the completion of the McCulloch boulevard between Jeffersonville and New Albany, Ind., across the Ohio River from Louisville, Ky. The turnpike, one of the finest in Indiana, is 1¾ miles long and extends through territory which is considered extremely valuable because of the sites it affords for suburban homes overlooking the river. Practically all of the land necessary for the 60-ft. boulevard was donated by public-spirited property owners between the two cities on the North Side, while the Louisville & Northern Railway & Lighting Company, New Albany, paid for grading the roadway throughout, which work cost several thousand dollars. The North Side is now in possession of an improvement which will undoubtedly bring many new residents to the boulevard and which will accordingly increase the traffic of the Louisville & Northern Company between the two Indiana cities and also across the river into Louisville.

Personal Mention

Capt. Julian L. Schley, assistant engineer commissioner of the District of Columbia, has been made executive officer of the new Public Utilities Commission of the District.

Mr. Motosuke Masuda, chief engineer of the Tokio (Japan) Municipal Railway, is on a visit to the United States to study electric railway operating conditions in the principal cities.

Mr. C. W. Avery, formerly freight agent of the Puget Sound Electric Railway at Seattle, Wash., has been appointed local traffic agent of the Tacoma companies and is located at Tacoma.

Mr. W. H. Somers has been appointed general traffic manager of the Puget Sound Electric Railway and other Stone & Webster properties on the Pacific Coast, with offices in Seattle. The position of general traffic manager is a new one, and the office of general traffic agent in Tacoma has been abolished.

Mr. S. W. Barnes, general manager of the Tonopah & Tidewater Railroad in Southern California, has been appointed traffic manager of the Central California Traction Company, Stockton, Cal., to succeed Mr. L. H. Rodenbaugh, who has become traffic manager of the Oakland, Antioch & Eastern Railroad.

Mr. A. J. Sampson, auditor of the Stark Electric Railroad, Alliance, Ohio, has been promoted to the position of assistant general manager of the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railroad. Mr. Sampson will supervise the auditing department along with his other position. Mr. F. L. Mowry, general manager, will divide his work with his assistant. Mr. Sampson came to the auditing department of the Stark Electric Railroad four years ago from Michigan. He has been in public service work for more than twenty years.

Mr. Joseph Davis, who has been an inspector on the Tri-State Railway & Electric Company at East Liverpool, Ohio, has been appointed superintendent of transportation of the Steubenville, Weirton & Wellsburg division, a new position with the company. Mr. Davis will have charge of all Tri-State business on the West Virginia side of the Ohio River from Wellsburg to Weirton and New Cumberland, W. Va. This work has been taken care of by Mr. W. H. Higley and Mr. H. E. Armstrong, superintendents of power and transportation of the Steubenville (Ohio) division. Mr. Davis will have headquarters at Follansbee, W. Va.

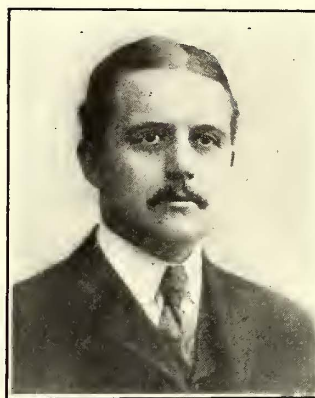
Mr. H. C. Eddy, formerly secretary of the District Electric Railway Commission, Washington, D. C., has been appointed engineer of the new Public Utilities Commission of the District of Columbia. The District Electric Railway Commission was succeeded on March 4, 1913, by the new commission, with the signing of the District of Columbia appropriation bill, which provided for a public utilities commission. The District Electric Railway Commission was organized by the Interstate Commerce Commission on July 1, 1908. Mr. Eddy was named as secretary and executive officer of the board on July 14, 1908, and served in that capacity during the life of the commission.

Mr. A. C. Harrington has been appointed manager of the Marquette County Gas & Electric Company, Marquette, Mich., to succeed Mr. W. J. McCorkindale, who has been appointed manager of the Wilmington (Del.) Gas Company, as previously noted in the *ELECTRIC RAILWAY JOURNAL*. Mr. Harrington entered the field of electrical construction in 1888 and later had charge of electric railway projects in London and St. Petersburg. He served as manager during the construction of the Pennsylvania & Erie Rapid Transit Railway and recently acted as supervising engineer for a large hydroelectric plant in Utah. In the operating field Mr. Harrington has served as manager of the South Covington & Cincinnati Railway, Light, Gas & Power Company.

Mr. L. H. Rodenbaugh has resigned as traffic manager of the Central California Traction Company, Stockton, Cal., effective on April 1, 1913, to become traffic manager of the Oakland, Antioch & Eastern Railroad, with offices in Oakland. Mr. Rodenbaugh was born at Plymouth

Meeting, Pa., April 1, 1874. He began his railroad work in 1890 with the Philadelphia & Reading Railroad, with which he served as a telegraph operator. Since then he had held positions with different steam railroads as block signal operator, telegrapher, freight cashier, agent, train dispatcher, ticket agent and traveling passenger agent, serving in these different capacities with the Pennsylvania Railroad, New York, Chicago & St. Louis Railroad, Missouri Pacific Railway, Old Colony Railroad, New York, New Haven & Hartford Railroad and the Southern Pacific Railroad. Mr. Rodenbaugh entered the employ of the Southern Pacific Railroad in April, 1903, as assistant agent. In January, 1905, he was appointed general passenger agent and held that position until June, 1909, when he resigned to become connected with the Central California Traction Company.

Mr. Wilbur Chapman Fisk, who was recently elected president of the Hudson & Manhattan Railroad, New York, was born in New York City on Feb. 22, 1868. He is a son of



W. C. Fisk

Harvey and Louisa (Green) Fisk. Mr. Fisk attended Princeton University and was graduated from that institution in 1890 with the degree of civil engineer. After his graduation he entered the banking house of Harvey Fisk & Sons, New York, founded by his father, the late Harvey Fisk, and became a member of the firm in 1898. Shortly after Harvey Fisk & Sons undertook the financing of the Hudson & Manhattan Railroad at the request of the directors and Mr. William G. McAdoo, then the president, Mr. Fisk accepted the

vice-presidency of the company. His technical knowledge was of great assistance to Mr. McAdoo in the construction of the tunnels under the Hudson River, and Mr. Fisk held the position of vice-president and general manager with the company until March, 1913, when he was elected to succeed Mr. McAdoo as president. Mr. Fisk was married in New York City on Feb. 9, 1893, to Miss Julia Herrick Allen. He is a member of the Union League Club, Princeton Club, Princeton Engineering Association, New York Yacht Club, Sleepy Hollow Country Club, Chamber of Commerce and Merchants' Association, and is an associate of the American Society of Civil Engineers.

OBITUARY

John Henry Schuck died at his home in Springfield, Ill., at the age of eighty-three years. He was one of the organizers of the Citizens' Street Railway of that city and was its president for a number of years.

Thomas J. Tucker, chief engineer of the Memphis (Tenn.) Street Railway, is dead. Mr. Tucker came to Memphis from Burlington, Ia., and entered the service of the company twenty years ago when it was under the control of Mr. C. K. G. Billings and his associates.

James Bricker, superintendent of transportation of the Philadelphia (Pa.) Rapid Transit Company, died at his home in Philadelphia on March 20, 1913. Mr. Bricker was born in Cumberland County, Pa., on Sept. 1, 1843. He served in the Civil War and had been connected with the street railways in Philadelphia for thirty-five years.

Seth L. Keeney, a director of the Brooklyn (N. Y.) City Railroad, died on March 13, 1913, at his home in Brooklyn, at the age of eighty-two. He began his career at the time of the Civil War and subsequently became a contractor. He was known particularly for his work in connection with the construction of the Fulton Street elevated railroad in Brooklyn, the construction of the Brighton Beach steam railroad and the Prospect Park & Coney Island Railroad, all of which are now a part of the system of the Brooklyn Rapid Transit Company. Besides being a director of the Brooklyn City Railroad, Mr. Keeney was a trustee of the Brooklyn Bridge and the Kings County Electric Light & Power Company.

Construction News

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

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

RECENT INCORPORATIONS

***Mount Tamalpais & Muir Woods Railway, San Rafael, Cal.**—Application for a charter has been made by this company to build a railway from the present terminal of the Mill Valley & Mount Tamalpais Scenic Railway to Mesa Station, near Willow Camp. Capital stock, \$500,000. Directors: James K. Lynch, Frank F. Bostwick, Charles H. Crocker, Charles E. Green, R. H. Pease, Jr., Kenneth C. Gillis and M. E. Fitzpatrick.

***Saluda-Hendersonville Interurban Railway, King's Mountain, N. C.**—Chartered in North Carolina to build electric railways. Capital stock authorized, \$150,000. Incorporators: J. M. Torrance, Bessemer City; W. A. Mauney, C. E. Neisler, King's Mountain; U. G. Station, Hendersonville.

***Piqua & Bradford Traction Company, Covington, Ohio.**—Incorporated in Ohio to build an interurban railway. Capital stock, \$10,000. Incorporators: J. H. Marlin, Hugh C. Marlin and A. W. Landis.

Middletown, Reading & Cincinnati Interurban Railway, Middletown, Ohio.—Incorporated in Ohio to build an electric railway to connect Middletown, Cincinnati, Monroe, Bethany, Reading and other towns. Incorporators: R. M. Billingslea, John Brate and Michael Klaiber, Jr. [E. R. J., Sept. 28, '12.]

***Interstate Railroad & Traction Company, Blackwell, Okla.**—Incorporated in Oklahoma with a capitalization of \$50,000. Incorporators: O. L. Brown, Arkansas City, Kan.; L. A. Brown, Louisville, Ky.; R. L. Self, Louisville, Ky.; C. B. Harrold and J. M. Van Winkle, Ponca City, Okla.

***Columbia & Nehalem River Railroad, Salem, Ore.**—Application for a charter has been made by this company to build an electric or steam railway from Wood's Landing in the eastern part of Clatsop County to the Nehalem Valley. Capital stock, \$1,000,000. Incorporators: J. C. Veasie, A. L. Veasie and J. H. Hendrickson.

***Williamsport, Nettle & Martinsburg Railway, Williamsport, W. Va.**—Chartered in West Virginia to build an electric railway from Williamsport to Martinsburg, a distance of 12 miles. Capital stock, \$250,000. Incorporators: Alexander J. Dilrich, John P. Michael and Eugene P. Hoffman, Baltimore, Md., and William Deale, Hamilton, Md.

FRANCHISES

Little Rock, Ark.—The Little Rock & Hot Springs Electric Railway has received a franchise from the Council in Little Rock.

Los Angeles, Cal.—The Pacific Electric Railway has received a franchise from the Council to double-track its line on Avenue Sixty-four in Los Angeles.

Fairhaven, Conn.—The Union Street Railway has asked the Council for a franchise for an extension in Fairhaven, so as to form a belt line to Fort Phenix.

Wilmington, Del.—The Wilmington & Philadelphia Traction Company has received a franchise from the Council to extend the Eighth Street line to reach the fair grounds in Wilmington.

Atlanta, Ga.—The Georgia Railway & Power Company has asked the County Commission for a franchise to double-track the river car line on Mayson Avenue and Turners Ferry Avenue from a point where the double track now ends along the avenue for 6100 ft. to a point near Chapel Street.

East St. Louis, Ill.—The East St. Louis & Suburban Railway has asked the Council for a franchise on Fortieth Street from Waverly Avenue to Forest Place and the northern city limits of East St. Louis.

Taylorville, Ill.—The Decatur, Sullivan & Mattoon Transit Company has received a franchise from the Council in Taylorville.

Dubuque, Ia.—The Union Electric Company has asked the City Council for a franchise on Locust Street in Du-

buque. A special election will be held on April 22 to vote upon this proposition.

Iola, Kan.—The Union Traction Company, Coffeyville, has received a franchise from the Council in Iola. The company plans to build an extension from Cherryvale to Iola in the near future.

Newton, Kan.—The Arkansas Valley Interurban Railway, Wichita, has received a franchise from the County Commissioners of Harvey County for an extension through Harvey County. The company has received a franchise from the Council in Newton.

Paducah, Ky.—The Kentucky Southwestern Electric Railway, Light & Power Company will purchase a franchise from the Council to enter Graves County.

Beverly, Mass.—The Bay State Street Railway will ask the Council for a franchise to double-track Cabot Street from the bridge to Fayette Street, Beverly.

Brockton, Mass.—The Bay State Street Railway has asked the Board of Aldermen for a franchise for an extension in Brockton.

Baltimore, Md.—The United Railways & Electric Company has asked the City Council for a franchise for a line on Carey Street, from Baltimore to Columbia Avenue, and on Bush Street, from Columbia Avenue to Ridgely, in Baltimore.

Bowling Green, Ohio.—The Toledo, Bowling Green & Southern Traction Company has asked the Council for a twenty-five-year franchise over the main street in Bowling Green.

Toledo, Ohio.—The Council Committee on railroads and telegraphs has instructed the city solicitor to prepare an ordinance giving the Toledo Railway & Light Company the right to construct a double track and loop on Broadway between St. James Court and the Boulevard, about 2000 ft. in length.

St. Catharines, Ont.—The Niagara, St. Catharines & Toronto Railway has received a two-year extension of time for the construction of its line from Port Colborne to Fort Erie and Niagara Falls and also for the line to Toronto.

Altoona, Pa.—The Altoona & Logan Valley Electric Railway has received an extension of time in which to complete the construction of the Eighteenth Street branch in Altoona.

Pittsburgh, Pa.—The Pittsburgh Railways has accepted the ordinance granting it a twenty-five-year franchise over Corliss Street, Pittsburgh.

Sherman, Tex.—The Texas Traction Company has received a franchise from the Council for a line to St. Vincent's Sanitarium.

Provo, Utah.—The Salt Lake & Utah Railroad, Salt Lake City, has asked the County Commissioners for a franchise over the county road crossing Provo Beach.

TRACK AND ROADWAY

Birmingham, Ensley & Bessemer Electric Railway, Birmingham, Ala.—This company announces that it has completed its East Lake division and will place it in operation at once.

Easton Railroad, Burlingame, Cal.—This company has placed in operation its 4-mile line from the Easton station on the Southern Pacific Railroad in Easton to the foothills. The company plans to extend this line to the Burlingame station in the near future. Ansel M. Easton, Burlingame, is interested. [E. R. J., Feb. 1, 13.]

Pacific Electric Railway, Los Angeles, Cal.—Plans are being made by this company to build a line to East Glendale. Rapid work is being done by this company on its line between San Bernardino and Riverside.

Washington Railway & Electric Company, Washington, D. C.—This company has been authorized by Congress to build a 2-mile branch between Wisconsin Avenue and the grounds of the American University and the bounds of the District.

Chattanooga & Chickamauga Interurban Railway, Rossville, Ga.—Grading has been completed and the track is being laid by this company on its line to Chickamauga Park. Work has been begun on the bridge at Rossville.

This line will connect Chattanooga, Tenn., and Rossville, Ga., and will eventually be continued beyond Chickamauga Park to Dalton and other towns in northern Georgia. Frank Spurlock, Chattanooga, is interested. [E. R. J., Nov. 23, '12.]

Chicago (Ill.) Railways.—This company has placed an order with the Lorain Steel Company for 12,000 tons of steel rails.

People's Traction Company, Galesburg, Ill.—Plans are being considered by this company to build an extension to Galva via Wataga, Oneida and Altona.

Peoria & Galesburg Interurban Railway, Peoria, Ill.—The Peoria Engineering & Construction Company has been incorporated in Illinois to build the Peoria & Galesburg Interurban Railway, which will extend from Galesburg to Peoria, via Canton, Farmington and Lewistown. It is proposed to take over and make traffic arrangements with the Illinois Central Electric Railway. L. L. Summer Company, Chicago, will have charge of the construction work toward Galesburg. Capital stock, \$15,000. Incorporators: C. B. Coffeen, James A. Fenelon and George C. Powers.

Tipton-Frankfort Traction Company, Tipton, Ind.—Right-of-way is being secured by this company for its line between Tipton and Frankfort. Franchises have been granted in Tipton and at Frankfort and it is expected that construction of the line will soon be begun. The company has opened offices in Tipton. E. Purtelle is interested. [E. R. J., Feb. 22, '13.]

Kentucky Utilities Company, Lexington, Ky.—This company is contemplating the construction of an electric line between Lexington and Winchester and is believed to be considering the establishment of an extensive system embracing Winchester, Mount Sterling, Paris and other points.

Frankfort & Versailles Traction Company, Frankfort, Ky.—This company is negotiating with a committee of members of the General Assembly of Kentucky with reference to the possible extension of an electric railway from Frankfort to the new Capitol. A tunnel may be constructed from the Capitol to the point nearest that edifice, which may be reached by a Shelby Street extension of the Frankfort system.

Madisonville, Ky.—Plans are being made to build a 10-mile electric railway between Madisonville and Nortonville. B. T. Robinson and W. W. Kingston, Madisonville, are interested. [E. R. J., Feb. 22, '13.]

Bangor Railway & Electric Company, Bangor, Maine.—This company has been asked to consider plans to build soon a 2-mile extension to its Hampden line. The company already has the survey for such an extension, this having been made for the old Bangor, Hampden & Winterport Railway.

Bristol & Norfolk Street Railway, Boston, Mass.—This company has asked the railroad commissioners for the right to extend its line from Randolph to Brockton.

***Tamaulipas, Mexico.**—A. V. Cole, Brownsville, Tex., has received a concession by the government of the State of Tamaulipas, Mexico, for the construction of an extensive system of electric railways in Matamoros, as well as an extension of lines in other towns in that section. Negotiations are pending for transfer of this concession by A. V. Cole to a syndicate of St. Louis men.

Tampico Light, Power & Transit Company, Tampico, Mex.—This company is asking for bids, through Carr Brothers, New York, N. Y., on track and overhead material, power and car equipment to be used in the electrification of its line.

Public Service Railway, Newark, N. J.—This company has been asked to consider plans for an extension to the Roseville section north of Orange Street and the Ampere section of East Orange.

Manhattan & Queens Traction Corporation, New York, N. Y.—This company is now building a line over Thomson Avenue, Long Island City.

New York State Railways, Syracuse, N. Y.—Improvements to cost \$250,000 are authorized for the Syracuse lines of this company. About 10 miles of new wire will be strung and 7 miles of track will be relaid and built. Included in this is the double-tracking of the East Syracuse

line through Shuart Avenue, Sedgwick Street and upper James Street. The University line will be extended to the Irving Avenue entrance to the stadium.

Northern Ohio Traction & Light Company, Akron, Ohio.—Business men of Akron, Barberton, Canton, Massillon and Ravenna met at Canton last week and formed an organization whose purpose will be to induce the Northern Ohio Traction & Light Company to build extensions and make improvements to local railways in those places and to improve its cars and equipment.

Cincinnati (Ohio) Traction Company.—Work will be begun at once by this company on the extension of its Avendale Street line to Bond Hill through Paddock Road.

Cleveland, Alliance & Mahoning Valley Railroad, Cleveland, Ohio.—Charles R. Morley, president of this company, has informed the business men of Ravenna, Ohio, that he will not extend this railway up into the center of Ravenna, as he had originally intended, but will build from the present terminus on the outskirts of Ravenna to a junction with the Ravenna-Akron line of the Northern Ohio Traction & Light Company. The line is in operation between Ravenna and Alliance and is being built between Ravenna and Warren. [E. R. J., Feb. 15, '13.]

Columbus Railway & Light Company, Columbus, Ohio.—This company plans to build approximately 3142 ft. of new track during the year.

***Coshocton, Ohio.**—Plans are being made by the United Service Company for the construction of a railway to connect Dennison and Zanesville, with a central power house at Coshocton. This plant would furnish current for power and light to Dennison, Uhrichsville, New Philadelphia, Canal Dover and Cambridge. S. E. Foster, New York, and J. B. Hill and L. H. Conklin, Scranton, Pa., are said to have made this announcement after a conference with C. H. Howell, manager of the plant at Coshocton.

Portsmouth Street Railway & Light Company, Portsmouth, Ohio.—Plans are being made by this company to build an extension to Jackson, Ohio. The Council of Jackson will be asked to grant a franchise for the operation of the railway inside the city limits of Jackson.

Ottawa & Morrisburg Electric Railway, Ottawa, Ont.—Plans and specifications are being prepared by this company and contracts will be awarded during the month for the construction of 15 miles of track. This 47-mile railway will connect Ottawa and Morrisburg via Leitrim, South Gloucester, Ormond, Winchester, Greely, Metcalfe, Williamsburg and Glen Becker, J. G. Kilt, Citizens' Building, Ottawa, president. [E. R. J., Feb. 1, '13.]

Brownsville, Ore.—The Great Northern Railway has been petitioned to build an electric railway from the main line west of Halsey through to Brownsville.

Portland, Eugene & Eastern Railway, Portland, Ore.—It is reported that this company plans to build a new steel bridge across the Willamette River in Albany. The company is now building a line from Albany to Wellsdale.

Bloomsburg, Millville & Northern Railway, Bloomsburg, Pa.—Work will soon be begun by this company on its line between Bloomsburg and Millville.

Philadelphia (Pa.) Rapid Transit Company.—This company has completed its arrangements for the construction of a terminal loop at Forty-fourth Street and Parkside Avenue, Philadelphia.

Pittsburgh (Pa.) Railways.—This company has been asked to build an extension in the Lincoln Avenue district beginning at Lincoln Avenue and Travella Boulevard and around the hill to Shetland Avenue and Larimer Avenue, Pittsburgh. The company consents to build this line if the Council will grant it the necessary franchise.

West Penn Railway, Pittsburgh, Pa.—Surveys have been completed by this company for a line between Pittsburgh and Wheeling, W. Va.

York (Pa.) Railways.—The extension of the Prospect Street line in York to Green Hill and Elmwood was authorized at a special meeting of the stockholders of this company. The improvements will be made as soon as permission is secured from the Council for the laying of tracks on the two highways in the southeastern portion of York and from the Maryland & Pennsylvania Railroad to

intersect its tracks at Yale Street. The East End extension will be in the form of a loop which will begin at the junction of Prospect Street and Albemarle Street to Ethan Street, thence north to Ethan Street and Yale Street to Third Avenue in Elmwood, returning on Third Avenue and Ross Avenue to Albemarle Street and Prospect Street.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—This company, which plans to place its line between Nashville and Gallatin in operation very shortly, may enter Nashville over the tracks of the Nashville Railway & Light Company without securing a special franchise for its operation.

Nashville Railway & Light Company, Nashville, Tenn.—This company's charter has been amended with a view to extending several of its lines in Nashville.

Dallas (Tex.) Electric Corporation.—This company plans to build about 6 miles of new track in Dallas and a 30-mile extension from Dallas to Terrell during 1913.

San Antonio, Fredericksburg & Northern Railroad, San Antonio, Tex.—This company has ordered 2500 tons of steel rails to be delivered April 1. This line will connect Fredericksburg with the San Antonio & Aransas Pass Railway, 4 miles north of Waring. R. A. Love, San Antonio, president. [E. R. J., Feb. 8, '13.]

Logan Rapid Transit Company, Logan City, Utah.—Work will be begun at once by this company on an extension from Logan to Ogden. Three routes are under consideration, one via Paradise and Ogden Canyon into Ogden, another by way of Wellsville Canyon to Brigham City, and a third by way of the old Short Line route across the divide to Collinstown and then down the valley to Brigham.

Pacific Northwestern Traction Company, Seattle, Wash.—Announcement has been made by this company that it will spend \$150,000 extending and improving its lines during the year.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—It is reported that this company plans to extend its Alki Point line in Seattle during the summer.

***Bluefield, W. Va.**—Plans for the construction of an electric railway between Bluefield and Princeton, W. Va., a distance of 12 miles, are now in the hands of the Chamber of Commerce of Bluefield, C. T. Boykin secretary. Power for the line will probably be secured from the Princeton Power Company, which is to be purchased by the railway company with the view of improving the Princeton power station.

Fayette Traction Company, Fayetteville, W. Va.—This company is asking for prices on second-hand 60-lb to 70-lb rails for about $4\frac{1}{2}$ miles of its line. This railway will connect Fayette, Fayetteville and Oak Hill. Robert H. Dickinson, Fayette, is interested. [E. R. J., March 15, '13.]

West Virginia Traction & Electric Company, Wheeling, W. Va.—It is reported that this company plans to build a line to Elm Grove.

Wheeling (W. Va.) Traction Company.—Plans are being considered by this company to extend the present Moundsville division line to New Martinsville, to connect later with Parkersburg and ultimately to establish a line between Cincinnati and Pittsburgh along the Cincinnati River front.

SHOPS AND BUILDINGS

Tampa (Fla.) Electric Company.—Work will be begun by this company within the next few weeks on the construction of its new office building at Tampa Street and Cass Street in Tampa.

People's Traction Company, Galesburg, Ill.—Plans are being considered by this company to build a new freight and passenger station in Galesburg.

Union Traction Company of Indiana, Anderson, Ind.—This company has awarded a contract to Charles H. Lennon, Winchester, for the construction of all stations on the new Muncie-Newcastle division of its line.

Vincennes North & South Traction Company, Vincennes, Ind.—This company will build its repair shops in Vincennes in the near future. B. M. Willoughby, Vincennes, president.

Louisville & Interurban Railway, Louisville, Ky.—Work has been begun by this company dismantling its old interurban depot in Shelbyville. The company has begun the

construction of a new depot in Shelbyville, using the materials of the old building. The structure will be 35 ft. x 35 ft.

Butte (Mont.) Electric Railway.—Construction will be begun at once by this company on a new carhouse in Butte. The structure will be 32 ft. x 140 ft.

Atlantic City & Shore Railroad, Atlantic City, N. J.—Plans for the construction of a concrete building by this company on the site of the old Chute-the-Chutes Park at the Inlet in Atlantic City have been announced. The structure will occupy an entire square and will have all the necessary facilities for the repairing of old cars. The offices of the company now quartered in the Stadler Building, on South Virginia Avenue, will be transferred to this new location, where plans have been made for a suite of rooms on the second floor.

Staten Island Midland Railway, New York, N. Y.—The Public Service Commission has granted the application of this company for permission to abandon Whitlock Station and to replace it with a new station about 1400 ft. distant, which is to be known as Bay Terrace.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—Plans are being made by this company to build new freight depots at Olean, Westons, Portville, Ceres, Bolivar, Shinglehouse, Allegany, Carrollton, Salamanca and other points. The company will also build a waiting room for passengers at St. Bonaventure's.

North Carolina Public Service Company, Salisbury, N. C.—Work has been begun by this company for its new carhouse located half way between Spencer and Salisbury. In the rear of this building will be a machine shop. On one side will be a storeroom. 25 ft. x 110 ft. [E. R. J., March 1, '13.]

Cleveland (Ohio) Railway.—This company has purchased a large tract of ground at Harvard and Radway Avenues, Newburg Heights, on which a carhouse will be erected to serve the Dennison-Harvard line that is to connect the South Side with Newburg. It is possible that it will also serve the East Fifty-fifth Street line and that the old carhouse on Fifty-fifth Street will be abandoned. Work on the Dennison-Harvard railway line will be begun this spring. The plan has been approved by the City Council.

Greenville, Spartanburg & Anderson Railroad, Greenville, S. C.—Work has been begun by this company on the construction of its new freight terminal station and yards in Spartanburg.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Vancouver, B. C.—This company plans to extend the Vancouver Island Power Company's plant at a cost of \$650,000. The company will also build a new substation on Richmond Road. The cost is estimated to be about \$75,000.

Tampa (Fla.) Electric Company.—Plans are being made by this company to build an addition to its power house in Tampa. It will install a single-unit turbine of 4000-kw capacity. The machinery for this improvement has been ordered.

People's Traction Company, Galesburg, Ill.—This company plans to enlarge its power station in Galesburg and will build a new substation on South Prairie Street in Galesburg.

Vincennes North & South Traction Company, Vincennes, Ind.—This company plans to build a new power house in Vincennes and probably one in Mooresville in the near future. B. M. Willoughby, Vincennes, president.

Philadelphia (Pa.) Rapid Transit Company.—This company has authorized the enlargement of its Beach Street power house in Philadelphia and the installation of approximately 20,000 hp in additional power-generating machinery. This increased supply of power, together with 6500 hp of additional purchased power, beginning Nov. 15, 1913, will serve to insure the continuity of the power supply and also make possible the operation of additional car service during the coming winter.

Scranton & Binghamton Traction Company, Scranton, Pa.—This company expects to build a new boiler house and has ordered three boilers.

Manufactures and Supplies

ROLLING STOCK

Union Electric Company, Dubuque, Ia., is reported to be in the market for six cars.

New York State Railways, Rochester, N. Y., expects to rebuild ten convertible cars on the Salina Street line into pay-as-you-enter cars.

Ashtabula (Ohio) Rapid Transit Company has ordered one double-end vestibule car with trucks from the G. C. Kuhlman Car Company.

Tampico Light, Power & Transit Company, Tampico, Mex., is asking prices through Carr Brothers, New York, N. Y., on several new cars.

East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill., has ordered three motor and two trail cars from the American Car Company.

Asheville (N. C.) Electric Company has ordered from The J. G. Brill Company six 20-ft. 8-in. semi-convertible car bodies with Brill 21-E trucks.

Five-Mile Beach Electric Railway, Wildwood, N. J., has ordered from The J. G. Brill Company two twelve-bench open-car bodies with Brill 27-GE-1 trucks.

General Electric Company, Schenectady, N. Y., has ordered from the Wason Manufacturing Company two steel cars with two motor and two trail trucks.

New York, New Haven & Hartford Railroad, New Haven, Conn., has ordered twenty-three multiple-unit motor cars, twenty-two multiple-unit trailers and twelve electric locomotives.

Lewistown & Reedsville Electric Railway, Lewistown, Pa., has ordered from The J. G. Brill Company three 28-ft. semi-convertible pay-within car bodies with Brill 27-GE-1 trucks and four extra Brill 27-GE-1 trucks.

Syracuse & Suburban Railway, Syracuse, N. Y., has ordered from The J. G. Brill Company two 34-ft. 4-in. semi-convertible combination passenger and smoking car bodies mounted on Brill 27-MCB-1 trucks.

Worcester (Mass.) Consolidated Street Railway has authorized the purchase of twenty-one double-truck cars. Fifteen of these cars will be used on the city lines and six on the line between Worcester and Springfield.

Phoenix (Ariz.) Railway, noted in the ELECTRIC RAILWAY JOURNAL of March 1, 1913, as contemplating the purchase of several new cars, expects to order possibly four new cars, which will be of the California type, open at each end and with closed center.

Lehigh Valley Transit Company, Allentown, Pa., has specified the following details for the six passenger, baggage and smoking cars which are being built by the Jewett Car Company:

Seating capacity	60	Air brakes ...	Westinghouse
Weight (car body only)	40,000 lb.	Car trimmings.....	bronze
Length over vestibule,	54 ft. 10½ in.	Control	A. L.
Length over all,	55 ft. 10½ in.	Couplers	Westinghouse
Width over sills, 8 ft. 9¼ in.		Curtain fixtures.....	Cur. S. Co.
Body	composite	Curtain material.....	Duplex
Interior trim	mahogany	Heaters	Consol. & Smith
Headlining	Agasote	Motors	4 West. 303
Roof	steam coach	Motors	inside-hung
Underframe	metal	Sanders	Universal
		Sash fixtures	Edwards
		Seats	H. & K.
		Trucks	M.C.B.

TRADE NOTES

Galena Signal Oil Company, Franklin, Pa., has voted to increase its common stock from \$8,000,000 to \$12,000,000.

Lackawanna Steel Company, Buffalo, N. Y., has elected H. G. Darton a director to succeed S. S. Palmer, deceased.

Electric Storage Battery Company, Philadelphia, Pa., has elected John R. Williams a director to succeed George D. Widener, deceased.

Standard Steel Car Company, Pittsburgh, Pa., is enlarging its New Castle plant by adding about 200 ft. to the main building of the wooden car department.

The **J. G. Brill Company, Philadelphia, Pa.,** has received an order from the Brooklyn (N. Y.) Rapid Transit Company for 230 Brill 39-E trucks. Orders have also been received from Stone & Webster, Boston, Mass., for sixty Brill 39-E trucks for its properties in Dallas, Fort Worth and Houston, Tex.

S. R. Schaff & Company, Louisville, Ky., has been formed by Schuyler R. Schaff, consulting engineer and specialist in public utilities, and Chester B. Starbird, electrical engineer, to engage in the development, extension and operation of public utilities within operating distance of Louisville. The office of the new firm will be in the Paul Jones Building, Louisville, Ky.

Edgar N. Easton has become associated with the railroad sales department of Joseph T. Ryerson & Son, Chicago, Ill., with headquarters at New Haven, Conn. John H. Craigie, formerly connected with the mechanical department of the Boston & Maine Railroad, has also joined the railroad sales department of the company, with headquarters at Boston, Mass.

Roosevelt & Thompson, New York, N. Y., has been formed by James A. Roosevelt and Samuel B. Thompson to make investigations and reports and give practical advice on the operation of electric railway and lighting properties. Mr. Roosevelt was formerly with the Third Avenue Railway, New York, N. Y.; Stone & Webster, Boston, Mass., and various properties in the west and south. Mr. Thompson was formerly with the Consolidated Railway, Baltimore, Md.; Sanderson & Porter, New York, N. Y., and consulting engineer in connection with various Pacific Coast properties. The headquarters of the firm are in the Empire Building, 71 Broadway, New York.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., was chartered in Delaware on March 15 with a capital stock of \$42,500,000 as a part of the plan for reorganizing the Allis-Chalmers Company. Of the new stock \$16,500,000 is preferred and \$26,000,000 common. The incorporators of the new company held an organization meeting early this week at which directors and officers were elected. Voting trustees who will manage the company for some time to come were also chosen by the reorganization committee. Directors for the Allis-Chalmers Manufacturing Company were chosen as follows: John H. McClement, chairman of the board of directors; O. H. Falk, president of the company; O. C. Fuller, J. D. Mortimer, G. G. Pabst and Frederick Vogel, Jr., all of Milwaukee; Max Pam and F. O. Wetmore, of Chicago, Ill.; A. W. Butler, C. W. Cox, O. L. Gubelman, R. G. Hutchins, Jr., Arthur Coppell and W. C. Potter, of New York, N. Y., and J. P. Winchester, of Wilmington, Del. The executive committee is as follows: Frederick Vogel, Jr., chairman; O. H. Falk, O. C. Fuller, J. D. Mortimer and G. G. Pabst. Active operation of the manufacturing plants will be started under the direction of five voting trustees as soon as the final steps in the reorganization are taken. This will probably be not later than May 1. Sale of the Illinois property is to take place on April 8 and confirmation of the sale will be given shortly afterward. A meeting of the reorganization committee will be held in the near future to determine the date for calling the remainder of the assessments on the old preferred and common stocks. There is still a payment of \$8 per share on the preferred and \$4 on the common stock to be made.

ADVERTISING LITERATURE

Clark Electric & Manufacturing Company, New York, N. Y., is mailing to the trade index cards showing its line of specialties.

Ross W. Harris, Madison, Wis., electrical engineer and traction expert, has issued a booklet entitled "A Traffic Survey and Twelve Reasons Why."

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued a new booklet on titanium in steel, which contains statements of steel manufacturers and scientists as to the uses and benefits of ferro-carbon-titanium.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. A4087, which illustrates and describes its direct-current motor starting panels for heavy service. Bulletin No. A4092 describes the company's type 1-10 Thomson watt-hour meter.