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CARHOUSE SPECIAL WORK

The recent construction of a carhouse with an inclosed ladder entrance track again brings up the question whether it is desirable practice from an economic standpoint to keep the special work under cover. It is sometimes necessary to roof over the special work at V-shaped carhouses or in those where the greater part of the available frontage is needed for a waiting room, but this is an unusual condition. In general, there is no more reason for covering special work at carhouses than there is to do so anywhere else on the system because the life of the track is limited by the conditions of service rather than by the weather. Doubtless, it is an operating convenience to have the special work protected against slush and ice, but the comparative rarity of that trouble and its easy correction do not seem to justify the expense of an extra wall and additional roofing. Neither is the covered ladder track of any value for storage purposes since it must be kept clear at all times for the operation of cars to and from the other tracks. While layouts of this kind are usually dictated by real estate conditions which are beyond the control of the company, it is well to bear that fact in mind when an installation of this kind is being considered.

PEAK LOADS FOR SURFACE CARS

The baneful influence of a peak in any load line was probably first recognized in power production. From this attention has been directed more recently to the peak in passenger traffic which exists because the majority of people want to ride to and from their business at about the same hours. Strenuous efforts to reduce or offset both of these have been made with considerable success, although the remedies are obscure and at best indirect. There is, however, another peak which is just as harmful as either of the foregoing but which differs from them in not being

an absolutely irremediable condition inherent in passenger transportation. This is the peak load of passengers on the cars themselves. The fact that a car is loaded to its absolute physical limit at some point on its route is by no means an indication that the maximum amount of work is being obtained from it. On the contrary, it is quite likely that over the major part of the run the car will be carrying no more than the proverbial "corporal's guard" and that it is, in consequence, being operated at a loss. Indeed, the inspection of a number of traffic-count curves, such as show the varying number of passengers on a car during its trip, indicates that on many lines there exists a peak in the loading of each car which is even more severe than that found in the daily load curve of a power station and which decreases the load factor of the cars to a point well below 40 per cent. Since an increase in this figure results in the release of an equal proportion of the equipment otherwise required for handling the rush-hour traffic the opportunity for economy through the establishment of a high load factor for the cars themselves is worthy of quite as much attention as that existing in the case of the power plant or the total daily traffic. The remedy, of course, is a judicious location of cross-overs so that the cars may be turned back at various points on the line. These points can be determined easily, of course, by traffic counts, and the destination of the cars which are to be turned back before they reach the end of the line should be plainly indicated. If this is done there should be no ground for reasonable complaint on the part of the public.

MAKING ACCIDENT EDUCATION ATTRACTIVE

The accident prevention campaign which is now being conducted by many electric railways is undoubtedly reaching a large portion of the public with excellent results, but few companies as yet have succeeded in arousing the hearty interest of the children, who, of course, are the sufferers in by far the greater proportion of serious accidents. Mature persons can be taught by appeals to their reason, but the average child is very unwilling to receive instruction unless that instruction is presented in an attractive form. Children want to be amused even while they are being taught, and they instinctively resent and pay little attention to obvious lecturing. The best railway operator, no matter how sincere, will prove a failure as a lecturer on accidents if he cannot present his topic on the plane of his audience without constraint. The experience of the Brooklyn Rapid Transit System's children's safety crusade, to which reference was made in the Oct. 25 issue of this journal, has proved that the permanent interest of school children can be maintained by the use of attractive lecture material, presented through the medium of trained speakers. The material consists of car models, original colored cards showing almost every kind of accident pos-

sible on the streets and finally a series of moving pictures. The lecturer is usually a woman who has the pedagogical skill to present the material not as a lesson but as a heart-to-heart talk about different children and what unhappiness came into their lives as the result of carelessness. To a sophisticated elder the accident scenes depicted in the moving pictures may seem too obvious a treatment of the subject, but they do attract the interest of the children, and that is the main thing after all. Doubtless, with more experience in this work, it will be possible to prepare scenarios in which the accident to the hero or heroine will carry the desired lesson in a more subtle yet equally effective fashion. Finally, the children are encouraged to write compositions upon the lecture they have heard, upon causes of accidents or even upon some accident which they have witnessed in the past. On one occasion a school paper was made up of compositions of this kind.

REAL COSTS OF INTER-DEPARTMENTAL WORK

In the estimates of electric railway engineers no error is more common than the failure to figure what a given job will cost the company as a whole rather than what it will cost their own department. This oversight, whether deliberate or accidental, is most frequent in operations where the use of electrical energy should be included as a portion of the cost. It would seem sometimes as if the electrical supply of the system was looked upon as an inexhaustible ocean which could be tapped at will without an accounting being made to anybody. It is true that in recent years the relation between the weight of cars and the size of the coal pile has become clear to all, but a further real saving in electrical costs is sure to follow if every department is charged with what it takes. Thus, the true cost of electric welding, whether in the shop or on the track, is yet to be determined on many systems. When the estimates on the comparative cost of each system of welding are prepared it is inevitable that electric welding should appear to be the cheapest if no allowance is made for the cost of energy. Yet nothing is more wasteful than the common method of obtaining welding current through banks of resistances. The fair procedure would be first to allow a unit charge per kilowatt-hour at a price settled with the electrical engineer of the company and then to determine whether the cost of current would be high enough to justify the purchase of a motor-generator set or the adoption of some other system of welding. Such a course should certainly be followed wherever great quantities of current are likely to be used as in the welding of several hundred or thousands of rail joints. Allowance for the haulage of material from storehouse to job is another uncredited drain on the power supply. This does not appear to be an inconsiderable item, for on one system, where every service car is operated on a mileage basis, the cost of hauling material for cast-weld rail joints is placed at 30 cents per joint. Even if this figure is purely arbitrary, it serves the purpose because in this respect at least all classes of joints can be compared on a common basis. Such instances as those quoted should be sufficient to prove that any work of one department which affects another may involve something more than nominal charges and countercharges.

INHERENT ADVANTAGES OF CENTRAL STATIONS

A paper of interest to officials of electric railways who are considering the substitution of purchased power for generated power was read by P. M. Lincoln at the last meeting of the American Institute of Electrical Engineers. In it the author states as a conclusion that the only reasons why central stations do not supply all of the electrical service within their territories are that the rates offered do not always bear a suitable relation to the cost of production and that some of the possible customers have motives other than the cost of supply for not purchasing their power from the central station.

No consideration is given by the author to the possibility of separate generation at a cost even approximately equal to that involved by production and distribution from a single center, this belief being based upon the economy in first cost of equipment accompanying increased capacity, the consequent opportunities for introducing labor-saving and fuel-saving machinery to reduce the cost of operation and the saving due to the diversified load which inevitably follows the service of many customers.

As applied to electric railway loads, except when they are small in amount, the first of these three reasons for the superior economy of central stations is of no great moment. The variation in first cost per kilowatt between stations of different sizes is by no means constant and in direct proportion to the capacity involved, and for magnitudes of the order of, say, 15,000 kw an increase of even 100 per cent brings hardly enough reduction in the unit cost to warrant any great consideration. In the matter of economy of operation, however, and especially with the incidental feature of reliability against break-down, the advantages of increased size are of importance up to a very much higher point. This applies especially to the possible close adjustment of the apparatus to the load carried and also to the small difference permitted between maximum load and maximum capacity of plant, notwithstanding the use, now generally conceded as a necessity, of large and economical units. The extent to which refinements may be carried is, in fact, limited only by the size of a plant, and where the first cost becomes relatively low on account of large-sized units the extreme elaboration of means to cut the cost of fuel and labor and to provide against shut-down by fuel storage, duplication of equipment and the like becomes more and more available as a commercial possibility.

In the matter of diversity of load, however, lies the greatest advantage for the central station, and to emphasize this there are cited in the paper a number of examples, of which the most interesting is a statement that in one of the Idaho irrigation districts the electric pumping plants to keep busy during the winter supply electric heat to the farmers at a price so low as to make it actually cheaper than the available coal burned in stoves. Another interesting figure is quoted in the case of diversity in large individual commercial lighting loads where the sum of the maximum requirements of several such consumers was found to be one and two-fifths times their actual maximum draft upon the central station.

The application of this factor in railway loads has been well brought out by Samuel Insull in a number of instances

in the past. It is, of course, an important matter for consideration by electric railways, for if its influence together with that of the incidental advantages of central-station operation really produces an inherently large reduction in the cost of producing electricity, it is no longer necessary to approach the problem of purchased versus generated power from any standpoint other than that of price, and the indirect arguments used heretofore in favor of purchased power for electric railways such as the opportunity for concentration of attention on traction matters, reliability of power supply and reduction of investment become of insignificant importance.

STANDARDIZATION OF PERMANENT TRACK

An analysis of the permanent types of track construction used in paved streets indicates that there is a marked difference of opinion among engineers as to the design and materials to use to carry similar classes of equipment. It is purely an engineering problem which may be determined just as accurately, if all factors are considered, as the design of a bridge or building. The decision as to the type of foundation to be employed resolves itself into one of the bearing qualities of the materials employed and the soil conditions upon which they are deposited. The load to be considered at any particular tie not only depends on the live load determined by the character of rolling stock and the dead load included in the paving surface, foundation, rail, etc., but is contingent upon the tie spacing as well. It does not appear necessary to consider the headway at which the cars are operated to determine the type of foundations. Close headways may require a somewhat greater factor of safety in the design to meet vibration, but a foundation built to carry the heaviest loaded rolling stock will be just as effective under a one-minute headway as under a ten-minute headway.

While engineers may consider the weight of the rolling stock in their selection of the type of rail to be employed, it is not apparent in a comparison of the types of track construction installed in various cities in this country. For instance, in cities having approximately the same population and practically the same character of traffic, rolling stock, subsoil, etc., one employs a 6-in. concrete foundation with 1 : 4 : 7 proportions and another an 8-in. foundation with 1 : 2 : 4 proportions. Undoubtedly one of these foundations has been improperly designed. To determine the correct design to employ it is necessary to select some standard basis or principles from which any design may be computed. The American Electric Railway Engineering Association could well consider this problem in order to determine the fundamentals upon which all track designs may be based. It may be suggested first that the design be determined by the maximum live load, which should include the weight of the heaviest car loaded to its capacity with passengers or materials, or it should be based upon what may be considered the maximum loading which may come to the track during the period of its life. As already stated, these fundamentals are in every way similar to those considered in the design of a bridge, and the selection of unit loading is purely one of engineering. After the adoption of the unit load, which necessarily must

be considered as a concentrated one, it will in a way determine the rail section to employ with a given tie spacing.

The depth of a concrete foundation is dependent upon several factors—first, the tie spacing; second, the richness of the concrete mixture employed; third, the bearing power of the subsoil, and, fourth, the concentrated load coming from the rolling stock, paving, tie and rail. Concrete transmits this concentrated load to the subsoil in different ways, depending upon the concrete mixture. If the mixture is poor, the load may be considered as being carried to the subsoil in the form of a truncated prism with practically vertical sides, because the bond between the particles in the concrete is of little value except under direct compression. If the mixture is correct or rich and the ingredients have been carefully selected, the angle of the sides of the compression prism increases from the vertical and may spread the load over a larger subsoil-bearing area. If steel bars are used for reinforcement, a thinner concrete foundation may be used to distribute the load over the subgrade. In practice, however, it has been found that the best and cheapest way to build the foundation is to use a simple concrete slab with a specified minimum depth and concrete proportions. Theoretically it may be possible to place rich concrete only under the ties for light cars, but the saving in concrete is counterbalanced by the extra cost of excavating. The finished job also is not waterproof, a quality necessary to produce maximum life. The cost, too, of depositing concrete in small batches is greater than that of depositing a continuous slab.

In the end, however, the service obtained from carefully designed foundations is limited by the life of the rail joints. At the present time best results appear to be obtained from joints installed to give rigidity equal to that of the rail. Experience has shown that it is unnecessary to provide for expansion and contraction of track in paved streets. This makes it practicable to use the welded or riveted joints or the mechanical joint with bolts driven in reamed holes. No mechanical joint, however, will remain absolutely tight unless the bearing area between the joint and the rail is free from scale and perfectly smooth so as to permit of a snug, tight fit. This joint, too, will fail unless nut locks or some other means are employed to prevent the bolts from becoming loose. Undoubtedly the best results would be obtained if it was practicable not only to ream bolt holes in the joint and rail and insert the bolts with a driving fit but if the contact areas of the joint and the rail were machined so that one would be absolutely assured of a perfect bearing. If the contact area between the joint and the rail is insufficient, a certain amount of play will develop as soon as the high points are battered down by vibration, and any play in the joint will ultimately mean track failure. For reasons already explained it is also unnecessary, in paved streets, to provide an opening between abutting rails. A tight joint at rail ends will eliminate the slight impact blow which develops with age, especially if the extra precaution has not been taken to grind the abutting rail heads to a perfect surface. The foregoing are only a few of the items worthy of consideration in permanent track design and construction and are offered as suggestions for arriving at track construction standards which will produce real permanent results.

ELECTRIC RAILWAY SECURITIES AS INVESTMENTS

During the past three or four years the total amount of sales on the New York Stock Exchange has shown a gradual but considerable decrease, and concurrently there has been a notable increase in the sale of new securities "over the counter" by various financial houses in the Wall Street district. Whether these two events are closely connected we are not prepared to say, but that there has been a change in the method of marketing securities everyone will admit. And a very striking feature of this change is that a large proportion in number of enterprises, if not in amount of those securities thus being marketed "over the counter," are those of electric lighting and power companies. This seems to indicate that such securities appeal to the average investor who can be reached by advertisements or by circulars as being more desirable forms of investment than the securities of either steam railroads or new electric railway properties.

In previous issues we have analyzed some of the special reasons for the favor with which electric lighting securities are held at present. One of these is the increased gross business enjoyed by the lighting companies because of the introduction of the tungsten lamp. Another is the comparative freedom from labor troubles which the lighting companies enjoy, owing to the smaller percentage of low-priced labor which they employ, as compared with either steam or electric railway companies. Still another is the greater latitude which they have in the way of rates, inasmuch as the companies are not generally held down by custom or charter for their service to a fixed maximum like the 5-cent fare, which is very close to the cost of production. On the other hand, there is no doubt that electric railway securities, in the opinion of investors, are suffering to-day partly because they have been obliged to retain this low rate for service with increased cost of materials and labor and partly because of the belief that a too general practice of capitalizing depreciation in the past has made the capital account disproportionately large as compared with the assets.

In considering this situation we are reminded of the remark of a prominent and very successful operator in Wall Street during the past generation who in a confidential moment once disclosed his method of buying and selling stocks. He said: "I have found that it is a pretty good plan to sell stocks when everybody else has been bullish on them for some time and to buy when the general market is thoroughly bearish. In that way one is pretty sure to sell near the top and to buy near the bottom." We do not believe that this would always be a safe plan to follow, but there is enough of truth in the remark to warrant us in considering what encouraging facts there are in the electric railway security situation, even if we admit for the sake of argument that all that the popular investor thinks about them is true.

If we do this we shall find many opportunities for optimism. In the first place, the existing situation in regard to low rates is now pretty well understood by the public and the companies themselves as well as by the authorities. If the steam railroads, which are also facing largely the

same problem and are also asking for an increase of rates, receive a concession, it should aid as a precedent in the request of the electric roads.

A considerable number of well-established interurban electric railways have already obtained fare increases. It is true that no satisfactory general solution has yet been reached as to the best method of increasing the fare on the city road, but at least there is a widespread recognition of the fundamental fact that such an increase is necessary if good service and extensions are to be expected, and this recognition must precede any means of relief. The same condition exists in regard to depreciation charges. Their necessity is recognized, and if the new and higher rates are to be based on the net receipts, the companies must logically be permitted to add the cost of depreciation to the operating expenses in the future, even if that has not been done in the past.

Finally, in several respects at least, the companies are in much better condition than ever before. In the first place, the narrow margin between receipts and expenses during the last few years has developed methods of economical operation which might not have been discovered under other conditions. In the second place, the population of the country and the demand for transportation has had its natural increase during the past few years, but during this time there has been practically a cessation in the construction of new track. In this way any over-construction that there might previously have been has been counteracted in a great many, if not most, parts of the country. Finally, any new franchises will be granted and accepted with the full knowledge that an electric railway enterprise is not an Eldorado. It is a service to be encouraged in every community, not to be mulcted for every privilege which it requests.

THE TRESPASSING PROBLEM

A recent issue of the *Outlook*, containing an article by M. A. Dow, general safety agent of the New York Central Lines, has brought into greater prominence than before the question of trespassing on steam railroads. Figures are presented from Interstate Commerce Commissioner McChord showing that during the last twenty years 181,379 trespassers were killed and injured on the railroads of the United States and during the year ended June 30, 1912, 10,971 trespassers were killed and injured. Twenty-eight persons a day killed or injured—a record surpassed by no string of disasters, grade crossing fatalities or any other source of danger. The essential point is, moreover, that over 75 per cent of these were not tramps or "hoboes," but rather able-bodied men of distinct value to the community and to their families as producing elements, wage earners and dependable units in the communities in which they lived. These figures include hundreds of women and children.

In this progressive and enlightened age conservation has become a watchword, conservation of natural resources, public health, even conservation of future generations through eugenics, but conservation of life, through the elimination of trespassing, has in the eyes of the public received almost an infinitesimal amount of attention.

This neglect, however, can no longer be charged against the steam railroads of the country, and the electric railways are not far behind. For example, safety committees on the Pennsylvania Railroad are required to indicate points where "No Trespassing" signs should be provided and be especially vigilant in reporting all points where trespassing is noted or is known to be the practice. In localities where children attending school make a practice of using right-of-way or otherwise trespassing the company endeavors to enlist the co-operation of the school authorities in warning the children, and by posting notices to call attention to the danger.

The New York Central Lines are another good example of safety campaigners. Besides general safety work the company is conducting a vigorous campaign against trespassing and it is trying to invoke the aid of the law of New York State to stamp out the reckless practice. The safety exhibit car of the company, previously described in the *ELECTRIC RAILWAY JOURNAL* of Aug. 9, 1913, has one section devoted to the trespass question, and in the migrations of the car along all the lines of the company it offers tangible evidence to employees in regard to this evil. In addition to this warning notices have been posted along the entire system and a special representative has been assigned to the work of interviewing every justice of the peace, police court magistrate and city court judge in towns along the line to seek their co-operation and to bring about a more rigid enforcement of the law. The road is also seeking the co-operation of manufacturers by personal communication, asking them to warn their employees against walking the tracks, and it is following this up by making arrests when the warning has been disregarded. This special campaign has been in operation only a few weeks, but already an improvement has been noted in localities where the work has been faithfully carried on, arrests have been made and punishment has been meted out.

These are only two examples of the work the railroads are doing to prevent trespassing—work that is carried on not only on their lines but also in the homes and the schools. On city and suburban electric lines trespass signs are not practicable because of the use of the public thoroughfares. Here safety prevention must depend on the safety education of the employees and on what is more difficult to secure, carefulness on the part of the public in the use of their own roads of communication. With the interurban lines, however, the trespass question more closely resembles the one with which the steam roads are struggling. For the three months ended Dec. 31, 1913, the Interstate Commerce Commission reports that, on interstate electric lines coming under its jurisdiction, out of a total of 111 persons killed, thirty-one were trespassers. In addition, on these lines, thirty-six trespassers were injured. These figures clearly indicate the problem before electric interurban lines to-day.

The interurbans really have a double duty to perform—first, by means of a general safety organization, use of rules and safety appliances, such as the steam roads use, to insure in both employees and as much of the public as can possibly be reached the beginning and the continued development of an inherent self-restraint and control, and, sec-

ond, to co-operate with the steam roads in keeping before the public and the legislatures statistics regarding the lives sacrificed to the trespassing habit and the social status of those lost until adequate laws are passed and enforced against the evil. The problem is much the same for each class of road. Much progress, we believe, has already been made by both steam roads and electric interurban lines, but the goal is far from being attained at the present time in either case.

THE LIGHT FREIGHT QUESTION AGAIN

The electric railway company, as a corporation, has suffered in its finances from the "increased cost of living," but in the opinion of many economists it can be made a very effective agent in the reduction of the cost of living to others, particularly to those living in large cities. The way in which this is to be accomplished is to use the tracks and cars of the electric road to bring in the food products from the surrounding country and carry them to convenient distributing points within the city rather than for the public to use the present cumbersome and expensive means of transportation provided by horse-drawn market trucks within the city limits and steam railroads for the longer hauls.

Our readers will remember an exhaustive analysis of this subject of market freight transportation as applied to Philadelphian conditions, compiled by Professor King of the Wharton School of Finance & Commerce and abstracted in this paper about a year ago. The subject has also become an active one in Cleveland now because the right to permit the railway company to conduct such traffic in that city is to be voted upon next Tuesday. Several of the daily papers in Cleveland have recognized the close relation between the transportation of package freight on the local lines in Cleveland and the cost of food in that city and are strongly urging the voters in the city to vote in favor of the plan. Some package business is now being carried on the Cleveland electric lines, but not to so great an extent as in some other cities, and the effect of the proposed ordinance and referendum, if carried, will be greatly to increase the possibilities of freight traffic in Cleveland along these lines.

Of course, many advantages will accrue from this method of local freight distribution besides those involved in an actual reduction in the cost of transportation. There is the reduced wear on the pavement by the substitution of cars running over rails rather than independent vehicles drawn or propelled over the pavement. A more frequent and rapid service between the purchaser and the distributing points, and hence to the consumer, is also obtained. In fact, there are so many arguments in favor of the plan—and there is none against it so far as we know except a senseless adherence to existing methods—that it seems surprising more has not been done along these lines. The fault has not been with the railway companies, which have long been familiar with the possibilities of light freight transportation, but, as a special permit is usually necessary to a company before it can conduct a business of this kind, the railways have been unable to establish such a service without the approval of the municipality.

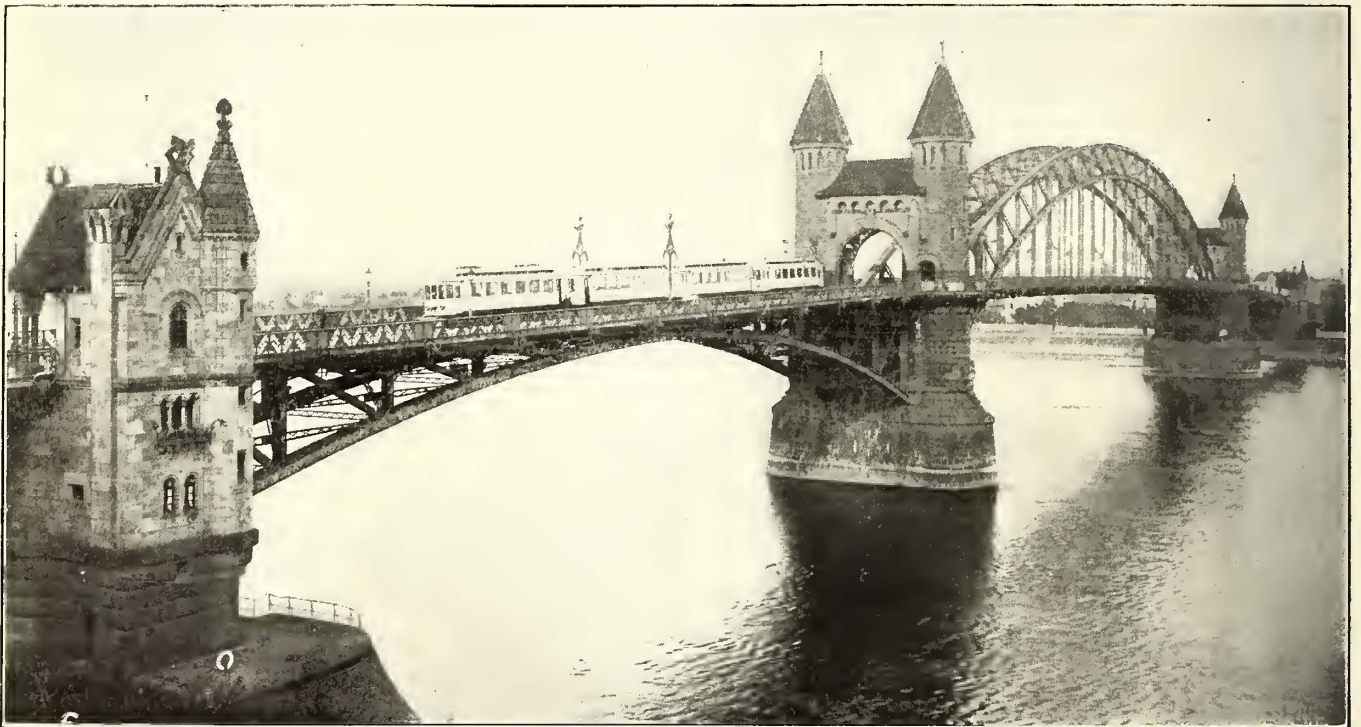
Rhine High-Tension Direct-Current Railways

This Is a Description of Two High-Tension Direct-Current Railways Which Are Operated in One of the Most Picturesque Parts of the Rhine River Country—Both Lines Approach the Standards of American Interurban Railway Practice

The Rheinuferbahn, a 17.6-mile railway in the Rhine Valley between Cologne and Bonn, is famous as the first railway on which high-tension and low-tension direct current was used on the right-of-way and city sections respectively. This road was placed in operation on Jan. 11, 1906, and its equipment was described in the *STREET RAILWAY JOURNAL* for May 5, 1906. While the passenger service is electric throughout, steam locomotives are also operated, principally for the purpose of transporting a local brown coal.

The great success of the Cologne-Bonn line, especially in attracting tourist travel, led to the completion in September, 1911, of a second electric railway which runs from Bonn to terminals at Siegburg and Königswinter. The

while the terminal divisions are fed from 518-amp-hr. booster-connected batteries at Hersel and Sürth, both of these places being located 3.1 miles from opposite sides of the generating plant. The main station equipment consists of one 520-kw and two 350-kw generators; two 12-kw, 1000/150-volt booster sets (one spare), which are connected to the outside battery stations over separate circuits, a 55/76-hp Pirani set (for the original battery capacity of 330 amp-hr.), now used for lighting, and a 120/195-hp Pirani set for the batteries. The battery houses require no permanent attendance because bell alarm signals are installed to notify the power plant men when the cells require electrolyte, etc.



Rhine Interurban Railways—Four-Car Train of Bonn-Siegburg-Königswinter Line Crossing Bridge on a 3.3 per Cent Grade

territory of both systems and the principal places served by them are shown in the accompanying map. The two roads have no physical connection, but their schedules are arranged to harmonize as closely as possible. Each line is equipped with Siemens-Schuckert station line and car apparatus for service at 1000 volts and 500-550 volts according to conditions. The latter installation, however, differs from the former in some particulars owing to the advancement of the art.

THE COLOGNE-BONN RAILWAY

When the Cologne-Bonn railway was projected 1000 volts direct-current was chosen in preference to higher-voltage single-phase equipment owing to the condition that it was necessary to operate on the standard voltage d.c. circuits of the Cologne and Bonn street railways. To minimize line losses, the power station was placed at Wesseling, the approximate center of the line. From this plant current is transmitted directly from 1000-volt generators and a 660-amp-hr. storage battery to the middle section of the line,

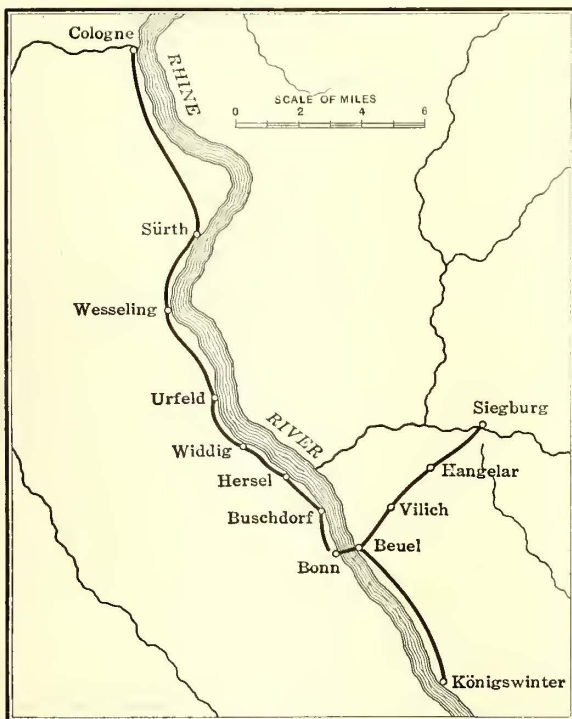
The Siemens-Schuckert line construction is of simple catenary form carried on latticed steel poles 164 ft. to 180 ft. apart, but a novelty at the time was the installation of two trolley wires per track. These wires lie in the same horizontal plane, but the distance between them varies from 5½ in. to 40 in. as they are staggered to equalize the wear of the pantograph current collectors. The main reason for using two trolley wires was to have ample current-collection points per car. The success of this practice has led to its adoption on the Bonn-Siegburg-Königswinter railway and on other lines which have been equipped by the same contractor.

The rolling stock consists of twenty-one motor cars, each seating twenty-eight second-class and twenty-nine third-class passengers; nine trail cars, seating a maximum of seventy-two passengers each; two passenger trailers with postal compartments; three market-produce trailers with folding seats for passenger use; one parlor trailer, three small trailers, etc. All cars are framed in oak except that the side sills are exposed channels. They are of the side-

entrance type with subdivisions for the smokers and non-smokers of each class. The end doors are for the use of employees, but they are also available to the passengers when necessary. Each motor car is equipped with two 130-hp commutating-pole motors geared 1:3.1, and when run at 710 r.p.m. these can move a loaded motor car and trailer, totaling 54 tons, at a maximum speed of 44.1 m.p.h. The control system is operated from a 65-volt storage battery circuit.

Weekday operation is given for twenty-two hours, namely, from 3:20 a. m. to 1:23 a. m., and holiday service from 4:07 a. m. to 2:03 a. m. Four expresses and three locals are in all-day hourly service, but an eighth train is run in the morning and late afternoon for the accommodation of workmen's and school traffic. The express trains make the 17.6-mile run in forty-four minutes, and the local trains do so in fifty-eight minutes. Of the total running time of the through trains, the 3 miles on the Cologne tracks require sixteen minutes and the 1.5 miles in Bonn six minutes. The maximum speed of trains on the right-of-way varies from 43 to 50 m.p.h. and is not permitted to exceed 12½

ets are generally used on the single-track sections and bridges on the double-track sections except at stations. In both cases light lattice poles of the same type are used in connection with channels for bracket or yoke members. Experience on the Cologne-Bonn line showed that the pole



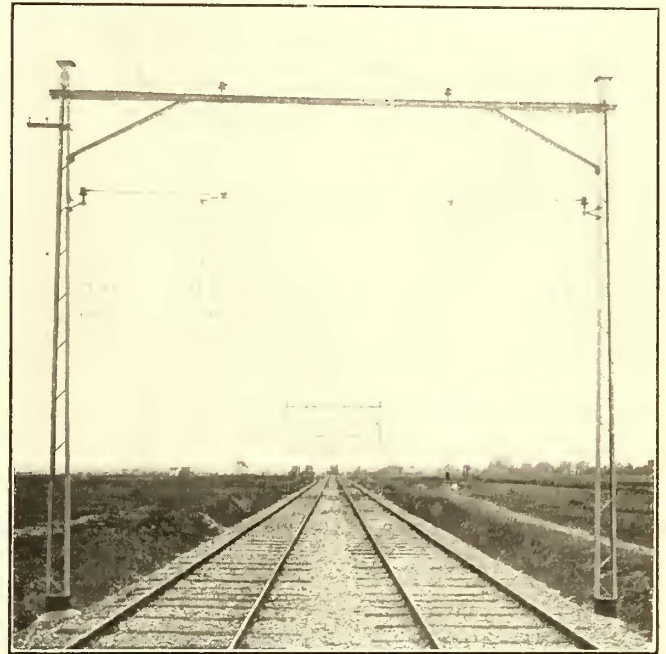
Rhine Interurban Railways—Map of Cologne-Bonn and Bonn-Siegburg-Königswinter Railways

m.p.h. on the city tracks. The total average daily run of through cars is about 332 miles. Every train consists of at least one motor car and one trailer. The other combinations are two motor cars and one trailer, or two motor cars and two trailers. The fine service given by this line is well patronized despite the fact that the fares are higher even than for similar service on American interurban railways. Thus, the second-class fare between Cologne and Bonn is 35 cents, or 2 cents per mile, and for the third-class riders 22.5 cents, or 1.3 cents per mile. The third-class travel is about four times as great as the second-class. The only difference in furnishings is the superior upholstery of the second-class compartments.

The cars are maintained at Wesseling. Their electrical equipment, brakes and lights are inspected dially. Regular overhauling is on the basis of 30,000 km (18,600 miles).

BONN-SIEGBURG-KÖNIGSWINTER LINE CONSTRUCTION

The types of overhead catenary construction selected for the Bonn-Siegburg-Königswinter line are well shown in the accompanying halftones. It will be seen that curved brack-



Rhine Interurban Railways—Catenary Bridges on Bonn-Siegburg-Königswinter Line

spacings could safely be increased from a minimum of 164 ft. to a minimum of 197 ft. and from a maximum of 180 ft. to a maximum of 213 ft. The catenary is carried on new-type insulators which are built up of a steel pin covered with vulcanized rubber and capped with green-



Rhine Interurban Railways—Curved Bracket Suspension on Bonn-Siegburg-Königswinter Line

glazed porcelain. The trolley wires are of 80-sq. mm section (almost No. 000).

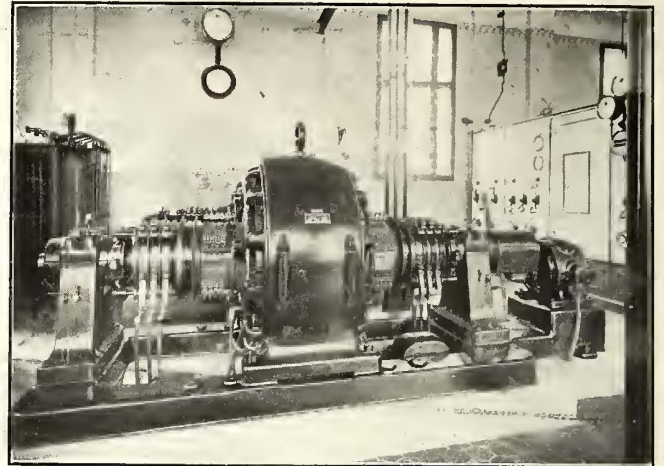
The clearance between the trolley wire and the head of the rail is 18 ft. on open track and 15 ft. 9 in. at bridges. Line section breakers are installed at every station and at

the junctions of feeder cables and trolley wires. On double-track sections each track can be cut out independently. The bridging switches and breakers of horn type are set on the adjacent pole and can be operated by authorized

former through a set of three collector rings. The rotary converters are started with 250-volt a.c. motors. The station further contains a 500-amp-hr. battery and a three-phase d.c. motor-generator charging set. Provision has



Rhine Interurban Railways—Combined Residence and Railway Station at Hangelar



Rhine Interurban Railways—Double Commutator Rotary Converter

employees by means of levers. At the Bonn city limit an insulated section about 200 ft. long, corresponding to a four-car train, is inserted in the line to bridge the gap between the 1000-volt and 560-volt divisions.

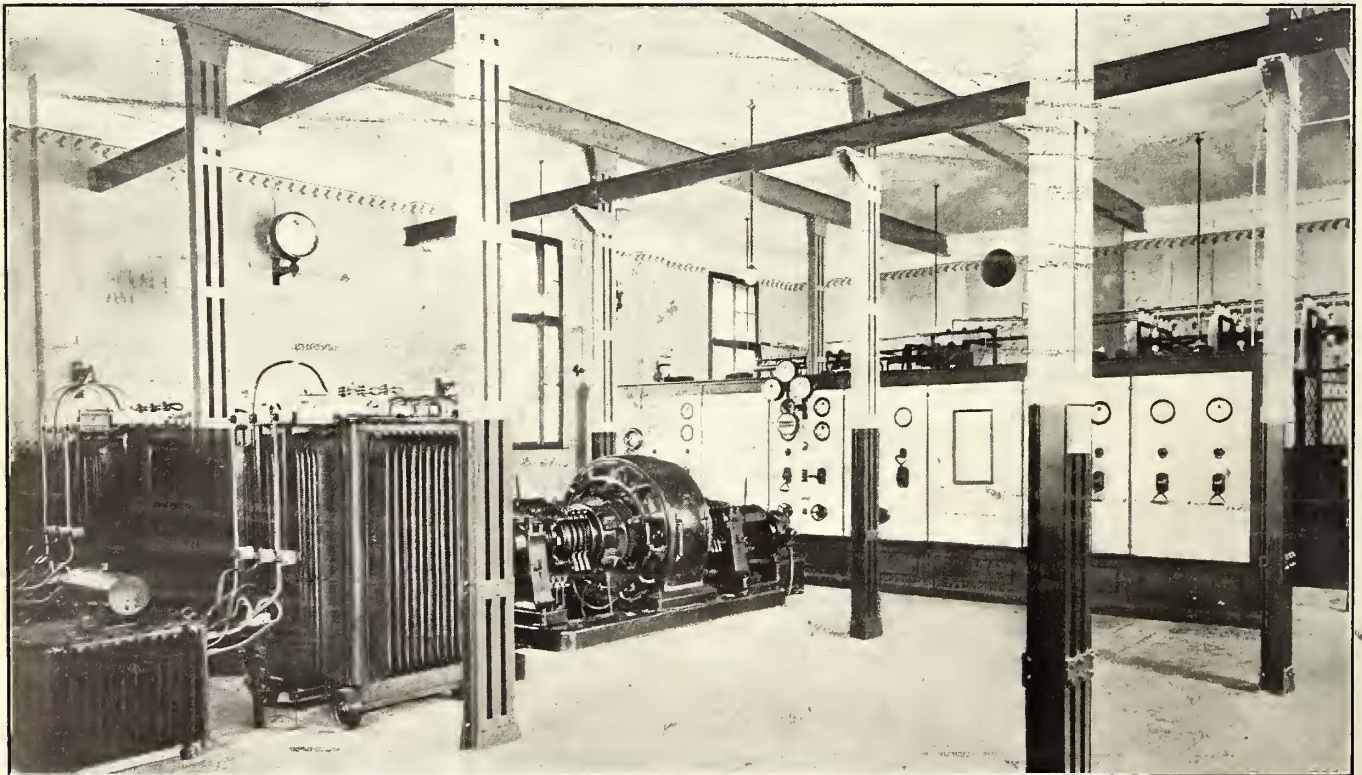
BONN-SIEGBURG-KÖNIGSWINTER ENERGY SUPPLY

Energy is transmitted at 10,000 volts, three-phase, fifty cycles, from a central station at Brühl to Ramersdorf, a distance of 18.6 miles. The Ramersdorf converter station is 3.3 miles from Königswinter. It contains two 350-kw,

also been made for the installation of a booster to raise the line voltage. An interesting feature of the switchboard is the use of a horn signal, in addition to the customary lamps, to announce the opening of a circuit breaker.

BONN-SIEGBURG-KÖNIGSWINTER ROLLING STOCK

The rolling stock consists of twelve motor cars and twelve trailers. These are about 46 ft. long over all and seat thirty-seven passengers each as compared with fifty-seven passengers on the Cologne-Bonn motor cars. The cars are



Rhine Interurban Railways—Ramersdorf Substation of the Bonn-Siegburg-Königswinter Line

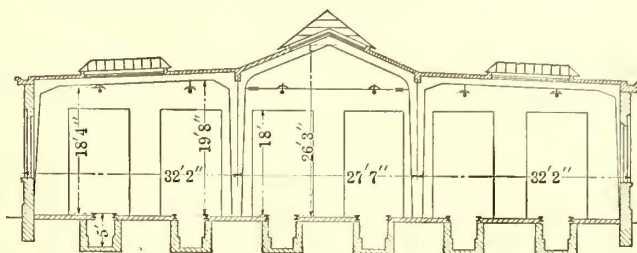
1000-volt rotary converters (one spare), transformers, etc. On account of the high voltage the rotary converters are of the double commutator type, each commutator being independently connected to the low-tension side of the trans-

of the vestibuled type with no side doors. Each car is arranged for only one class of passengers but has the usual compartment for smokers and partitioned cabs for the motorman. The seating arrangement is somewhat un-

common for German cars in the use of longitudinal corner seats. The widths of the seats are as follows: single cross seat, 20 in.; double cross seat, 42 in.; three-seat corner, 64 in. The aisle between the cross seats is 20 in. wide. This seating arrangement has been found very effective for rapid loading and unloading. A feature which encourages pleasure riding is the use of windows fully 64 in. wide. However, to prevent danger to the public these windows are constructed to drop only half way. The cars are constructed of oak framing with exposed channel-iron side sills. They are finished in mahogany and have seats of teak. The weight of a motor car empty is 50,000 lb. and of a trailer 28,600 lb.

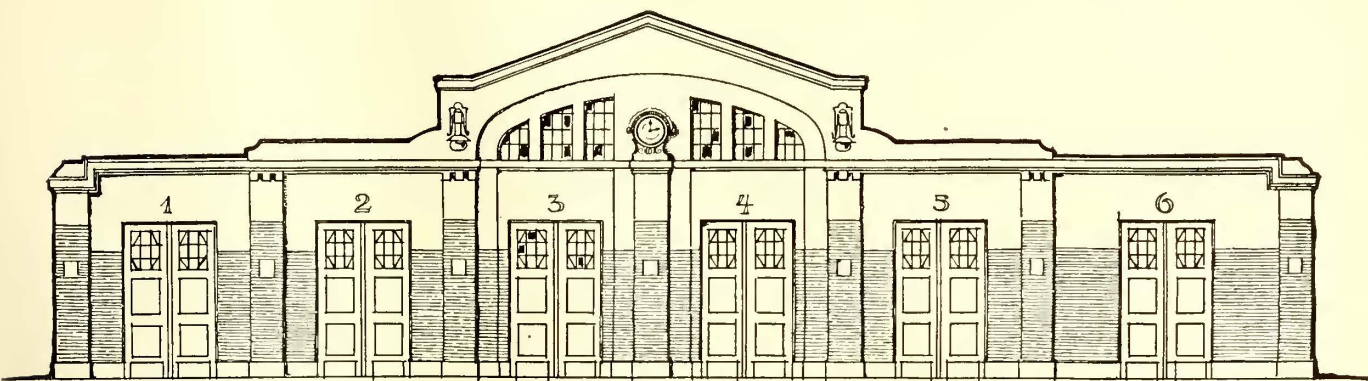
Each motor car is equipped with two 85-hp, 650-r.p.m. motors, geared 1:4.35. The motors have shunt-field connections to permit a 50 per cent variation in speed. They are much smaller per horse-power output than the Cologne-Bonn equipments. The compressors are wound for a maximum voltage of 750 volts so that it is necessary to cut resistance in automatically when the cars are on the 1000-volt division. Multiple-unit control current is taken di-

rectly from the line instead of a storage battery. This change requires greater care with regard to insulation but it avoids battery maintenance, which on the Cologne-Bonn



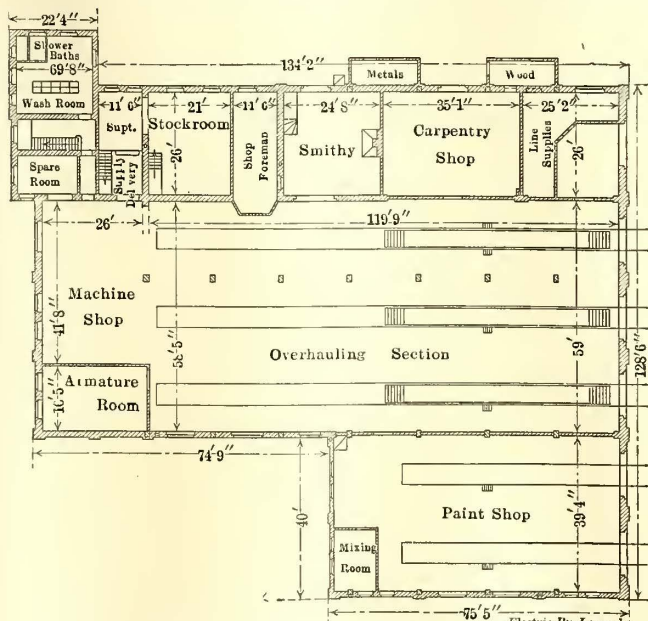
Rhine Interurban Railways—Section of Beuel Carhouse

rectly from the line instead of a storage battery. This change requires greater care with regard to insulation but it avoids battery maintenance, which on the Cologne-Bonn



Rhine Interurban Railways—Front Elevation of Beuel Carhouse

rectly from the line instead of a storage battery. This change requires greater care with regard to insulation but it avoids battery maintenance, which on the Cologne-Bonn



Rhine Interurban Railways—Plan of Beuel shops

Railway, for example, costs \$1,250 to \$2,000 a year for twenty-one cars. All resistances are inclosed in perforated steel screens to protect them from mud and dirt. The resistances are easily removed by loosening a few bolts, and they receive attention only at the regular overhauling. Each car is furnished with twenty-four 25-cp tantalum lamps. On

Rhine bridge, shown in an accompanying illustration. Train service is given from 5:35 a. m. to 12:35 a. m., usually at thirty-minute intervals. The run of 7.4 miles from Bonn and Königswinter is made in thirty-five minutes. The distance between Bonn and Siegburg is 6.2 miles and is made in twenty-three minutes. Cars are maintained at the Beuel shops hereinafter described.

The average daily run of a car is 248 miles. In addition to the daily inspection, cars are overhauled every 40,000 km to 50,000 km (25,000 to 31,000 miles).

CARHOUSE AND SHOP BUILDINGS

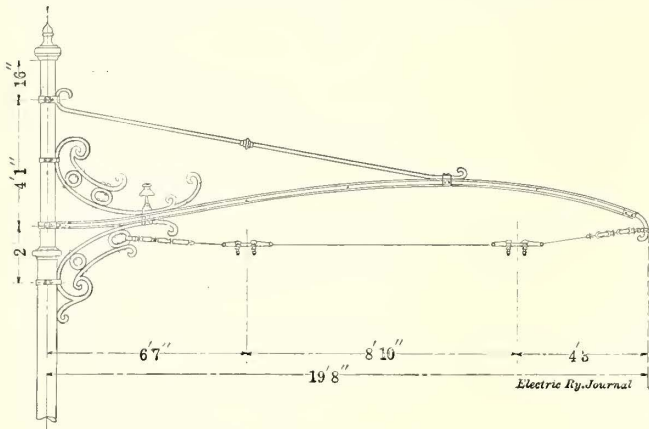
A very fine carhouse and adjacent shop, both of reinforced concrete construction, have been erected at Beuel. The carhouse is a double-end structure about 210 x 90 ft. Each of the six tracks accommodates four cars. The distance between track centers is 13 ft. 9 in. The roof is carried on two rows of reinforced concrete columns which are tapered downward to give the maximum clearance. These columns are spaced about 16 ft. apart longitudinally and 27 ft. 6 in. transversely. The accompanying cross-section shows the use of a continuous longitudinal skylight in the middle bay, transverse unit skylights in the other bays, and a series of windows in the side walls. The skylights are of wired glass. The ends of the carhouse and part of the steel-framed doors are also glazed. This care to insure ample daylight has produced a very pleasing interior, the cheerfulness of which is further improved by stenciled borders along the walls. A feature which tends to maintain the neat appearance of the building is the use of tile in the walls at water outlets, so that spattering water cannot stain the walls.

All of the tracks are furnished with closed concrete pits about 5 ft. deep. Two cross pits are also provided. Owing to the excellent natural light, permanent pit lamps are not required, but sockets are installed at convenient intervals.

The building is heated from a basement plant through

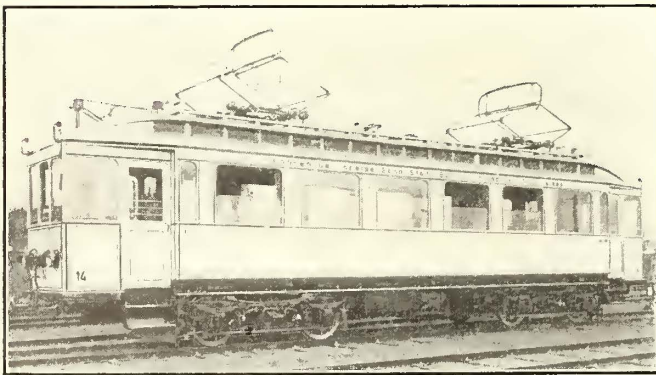
galvanized steel ducts, but it is stated that this indirect heating has not proved as satisfactory as steam. The car-house utilities rooms are in a small lean-to.

The general layout of the shop building is shown in an accompanying plan. In construction it is similar to the carhouse except that the floor is of wood block instead of



Rhine Interurban Railways—Artistic Bracket for Double Track

concrete. The skylight is of monitor type with swing sash for ventilation and, like the carhouse, the walls embody a liberal amount of glazing. The building is steam-heated through wall registers and radiators. Of the five tracks, two, serving one car each, are in the paint shop, and three, serving two cars each, are in the overhauling shop. The latter is equipped with an 11,000-lb. crane. The plan shows the partitioning of the various shops for purposes of fire protection. Unlike the other section, the paint shop opens only to the track entrance and its mixing room has been isolated with special care. All machine shop tools, except the wheel lathe, are group-driven from a 16-hp, 210-volt, three-phase motor. The lathe is driven by a 6-hp motor. Following the usual care of German shops, the step-down



Rhine Interurban Railways—Standard Motor Car with Extra Wide Windows

transformer and switching equipment for the motors is placed under lock and key in a screened compartment.

As indicated in the plan, the convenience of the employees is served by a washroom with shower baths. Part of the basement level is used for a heating plant and toilet and part of the second-story level serves for a stockroom and living quarters for the caretaker.

The Montreal Street Railway has adopted orange as a standard color for its suburban and interurban cars owing to the fact that that color is visible at a great distance, especially against dull landscapes. This change is considered a good safety precaution on single-track lines where no dispatchers are used and for like situations.

PROPOSED MODIFICATION OF DRASTIC CHICAGO ELECTROLYSIS ORDINANCE

By a vote of twelve to four the local transportation committee of the Chicago City Council, after an animated all-day session on Oct. 25, approved a modification of the existing electrolysis ordinance to which the local traction companies have been so resolutely opposed. This ordinance was adopted by the City Council on July 15, 1912, and provided that there shall be no drop in voltage between any two points on the electric railway grounded return exceeding a maximum of 12 volts. It also further provided that between any two points on the return 1000 ft. apart, within a mile of the City Hall, the drop shall not exceed 1 volt, and between any two points on the return 700 ft. apart outside of this mile limit the drop shall not exceed 1 volt. The return-current flow in pipes and cable sheaths must not be greater than certain limits set forth in the ordinance, and it is also provided that the electric railway companies shall equip their uninsulated return-current systems with pilot circuits and instruments so that chart records can be kept to show whether the ordinance is complied with.

When this ordinance was under discussion it was opposed bitterly by the surface and elevated railway companies. An extended report of the discussion for the committee of the Council was published at the time in the *ELECTRIC RAILWAY JOURNAL*. In spite of its passage the ordinance has never been enforced, although the railway companies have done a great deal to improve the conditions. Suits have been brought in court to compel compliance with the law, but they have never come to trial, owing to the pendency of the so-called merger negotiations in which the electrolysis subject is involved. The maximum allowable drop before the passage of the 1912 ordinance was 25 volts between any two points within the city limits.

During the present merger negotiations the Board of Supervising Engineers, Chicago Traction, was asked to report on this subject. It said that so far as it knew there is no place where the conditions imposed upon the companies using grounded return circuits are so severe as those imposed upon the Chicago street railway companies by the 1912 ordinance. Further, it was the opinion of the board that there is no electric railway installation in existence where greater care has been taken to prevent damage from electrolysis on grounded return circuits than by the surface street railway companies of Chicago.

The National Bureau of Standards at Washington was also requested recently to send an expert to Chicago to advise on the subject. Burton McCollum, associate physicist of the bureau, went to Chicago in answer to this request and spent a week there during October of this year. As a result of the investigations of the representatives of the United States government the city of Chicago and the Board of Supervising Engineers it was agreed that the necessary first cost for the initial investment required of the companies to comply with the 1912 ordinance would be \$4,984,424, provided the ordinance was interpreted upon an average maximum load for a fifteen-minute period. Mr. Palmer, the city electrician, however, said that the net cost would be about \$3,000,000, taking into consideration only the cost of apparatus not useful to the companies otherwise than for correction of electrolysis.

The Board of Supervising Engineers was then asked by the Council to recommend a modification of the 1912 ordinance and suggested a compromise plan which has been approved by a sub-committee of the local transportation committee of the Council. This plan, drawn up by Bion J. Arnold, chairman of the board, is substantially as follows:

PROPOSED ORDINANCE

The city is to be divided into three zones. The first or inner zone is to comprise the most congested district, bounded

by Chicago Avenue on the north, Lake Michigan on the east, Twelfth Street on the south and Halsted Street on the west. The second or middle zone comprises the more congested portion of the territory in the city lying outside of the first zone, while the third zone takes in that portion of the city not included in the other two zones. All uninsulated electric return circuits are to be so arranged that the sustained maximum difference of potential between any two points on any uninsulated portion of the circuit shall not exceed 10 volts in the inner zone, 15 volts in the middle zone and 20 volts in the outer zone. The Board of Supervising Engineers is to have the power, however, to prescribe limits from time to time, notwithstanding the exact figures mentioned in the plan. This is to provide for the potential gradient. It also has the power to increase the allowable drop in the outer zone to 25 volts at such points as it may deem advisable for the extension of track in outlying districts of the city where the underground utilities are not fully developed. The term "sustained maximum difference of potential" is defined as the highest average difference of potential for any thirty-minute period during normal conditions of operation. Wherever pipes or other underground metallic work are found to be electrically positive to the rails or the railway return circuit, they may, upon the direction of the Board of Supervising Engineers, be connected by conductors so arranged as to prevent the flow of current from the pipes to the ground.

Within three months from the date of the passage of the ordinance the railway companies shall file with the Board of Supervising Engineers and the city electrician a statement showing what plans they have adopted to comply with it. At the end of six months a further report must be made. Within one year from the date of the passage of the ordinance the companies shall have completed the necessary installations in connection with at least two of their power-supply stations. Within the period of two years the provisions of the ordinance must have been complied with by the companies throughout their entire railway systems. This is to be accomplished by the expenditure of not less than \$1,000,000 as directed by the Board of Supervising Engineers, if, in its judgment, this expenditure is considered necessary. The companies shall expend further such additional amounts upon return circuits and other electrical apparatus as the Board of Supervising Engineers may from time to time prescribe in order to prevent damage from electrolysis. The penalty for failure to comply with the terms of the ordinance is a fine of from \$50 to \$200 a day during the time the offence continues.

DISCUSSION OF PROPOSED ORDINANCE

This proposed ordinance was considered at a public hearing held in City Hall on Oct. 25 at a joint meeting of the local transportation committee and the committee on gas, oil and electric light of the Council. Those present included Mr. Palmer and his assistants, Mr. Arnold and the other members of the Board of Supervising Engineers, L. A. Busby, president of the Chicago City Railway, W. W. Gurley, representing the Chicago Railways, and a large audience of engineers and others interested. Finally a vote was reached by which the committee upheld the Arnold modified plan by a count of twelve to four.

During the hearing Mr. Arnold said that the board's estimate of the net cost to the surface railway companies to carry out the provisions of the 1912 ordinance was \$4,000,000, but admitted that Mr. McCollum's estimate was \$2,800,000. He also admitted that Mr. McCollum, who was not in Chicago at the time of the public hearing, had said that the zone system was of little value and that the important thing was the potential gradient. To this Mr. Arnold substantially agreed and said that his plan contemplated potential gradients although it did not specifically tie the board to any of the several systems of miti-

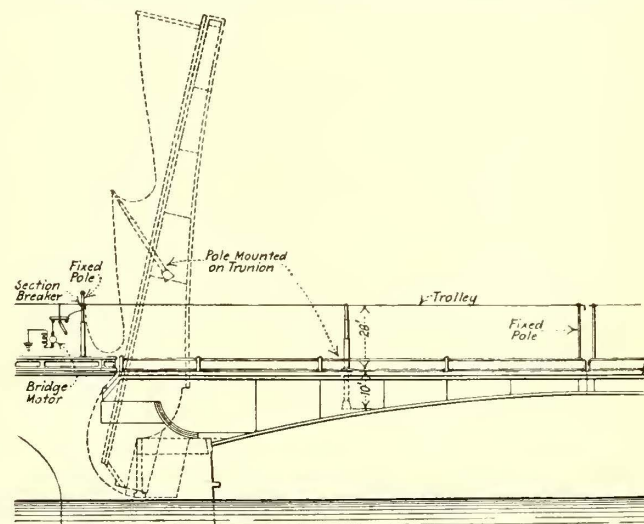
gation. Mr. Busby, speaking for the street railway companies, regarded the modification of the electrolysis ordinance as vital and declared flatly that the companies would not accept the ordinance with the modification of the electrolysis ordinance left out.

Mr. Palmer made a strong plea for the 1912 ordinance and claimed that the proposed ordinance was so indefinite that it would be very unsatisfactory to enforce it.

The ordinance as passed by the committee must be passed by the City Council and approved by the Mayor to become law. If that is done, it would seem to be likely that similar action will be taken in the case of the elevated railway companies and the Chicago Tunnel Company.

TROLLEY WIRE TAKE-UP FOR BASCULE BRIDGE

A novel arrangement for taking up slack in the trolley wire over a bascule bridge when the span is raised has been installed by the Toledo Railways & Light Company on the Cherry Street bridge at Toledo, Ohio. In the design of this structure no towers or overhead construction were permitted, so that the usual trolley retractor equipment had to be abandoned. The problem of drawing up slack in the wire is, however, successfully met by providing a pivoted



Novel Trolley Wire Take-Up

trolley pole having its lower end loaded with a weight sufficient to hold it in a vertical position regardless of the angle at which the bridge-leaf stands. In this way the slack which accumulates ahead and behind the pivoted pole is divided equally on both sides, keeping the wire always clear of the rail.

As shown in the accompanying illustration, the weighted center poles are carried on heavy trunnions, which permit the member to maintain its upright position independent of the bridge position. These poles stand 18 ft. above the roadway, and the weighted portion extends 10 ft. below the trunion mounting. For the bridge section, No. 0000, flexible hard-drawn stranded wire is used as the trolley conductor. The bridge section is separated from the main line by an insulating breaker, and receives its energy through one position of a double-throw switch, the other side of which supplies the bridge motor. To operate the bridge, therefore, this switch must first be thrown, thus automatically disconnecting the trolley wire before the lift motor can be started or the bridge moved.

The Cherry Street bridge has been in continuous operation since early spring, being lifted from fifteen to twenty times a day. According to W. E. Richards, superintendent of the electrical department, Toledo Railways & Light Company, it has developed absolutely no faults whatever in this long period of practical use.

Fender and Wheel-Guard Tests in Vancouver

A Full Report Has Just Been Made Public of the Tests Recently Conducted at Vancouver, B.C., to Determine the Value of Wheel Guards in Connection with Fenders—A Series of Tables Giving the Results with Different Types of Apparatus Is Presented

For the purpose of comparing the action of different types of fenders and to demonstrate their fitness for service under local conditions, tests of three fenders and two wheel guards were recently made at Vancouver, B. C. These tests were conducted in the presence of government and company officials and representatives of the fender manufacturers. A preliminary report of this test was published on page 347 of the ELECTRIC RAILWAY JOURNAL for Aug. 30.

In the accompanying tabular results, the tests in which the fender was operated manually have been rated on an equal basis with those entirely automatic. This does not, in the opinion of company officials, fairly permit of a direct comparison of results, as manual operation manifestly gives advantages over the automatic method greatly in favor of the fender. All manual trip tests were made by having the motorman drop the fender about 3 ft. from the dummy.

The tables give the results of the tests as tabulated by the government inspector of tramways, the gradings of A,

One of the objects of the test, a full report of which has

TESTS AND RATINGS OF FENDERS

	Speed, m.p.h.	PAVEMENT TEST									GRAVEL TEST									Summary Pavement			Summary Gravel			Averages
		Upright			Head On, Diagonal	Head On, St'ght	Feet On, St'ght	Upright			Head On, Diagonal	Head On, St'ght	Feet On, St'ght													
		Back On	Face On	Side On				Back On	Face On	Side On																
		76 lb.	76 lb.	76 lb.	130 lb.	50 lb.	130 lb.	50 lb.	130 lb.	50 lb.	100 lb.	100 lb.	100 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.					
Pogue.....	8 10 15	C B	A C	A C	A* B	B* A	C* B					A B C	B* B* B*	B* B* B*	C* A*	83.5 58 75	75 83½		75 66½ 83.5	75½						
Watson.....	8 10 15	D B	B C	A B	With A	hd A	ra A	wn A				C D E	Wi A	thd B	ra B	wn B	66½ 66½		25							
Nelson.....	8 10 15	A A	A B	A A	A A	A A	B B					A A A	A A B	B B B	B B B	100 91½		100 83½ 83½	91.7							

*Manual tests.

just been made public, was to discover whether additional safety to pedestrians could be secured by the use of wheel guards in conjunction with the type of fenders tested. This matter was brought up by an act passed by the provincial government of British Columbia on Jan. 1 of this year which states, in specifying what safety appliances must be used on electric street cars, that a suitable fender and a wheel guard must both be provided in all cases.

B, C, D and E, made after the car came to a standstill, being as follows:

For a complete pick-up or removal from the track by either fender or wheel guard, a test grade of "A," counting four points.

If any part of the dummy remains under the fender or wheel guard, but is partially picked up or removed from the track, a test grade of "B," counting three points.

TESTS AND RATINGS OF WHEEL GUARDS

	Speed, m.p.h.	GRAVEL SURFACE												PAVEMENT												Summary, Gravel		Summary, Pavement		Averages
		Across		Head On, Diagonal	Head On, St'ght	Head On, at Rail	Feet On, Diagonal		Feet On, St'ght		Speed, m.p.h.	Across		Head On, Diagonal	Head On, St'ght	Head On, at Rail	Feet On, Diagonal		Feet On, St'ght											
		80 lb.	50 lb.				80 lb.	50 lb.	80 lb.	50 lb.		80 lb.	50 lb.				130 lb.	50 lb.	130 lb.	50 lb.	130 lb.	50 lb.	130 lb.	50 lb.	130 lb.	50 lb.				
		80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.	80 lb.	50 lb.									
Watson.....	10	B B	B C	B B	D B	B B	B C	C C	8 15	E C	C B	A A	A C	B B	A A	B B	A B	B A	C C	B B	B B	62.5 66.7	66.7 79½	79.2 71	70.9					
Hudson & Bowring.....	10	C B B	B B	B B	B B	D A	D B	B C	8 15	A B	A A	B D	B C	B B	B B	B B	B B	C A	B B	B B	B B	54.1 79½	75 58½	79½ 79	70.8					

About 120 tests were made in all. More than fifty fender tests were made on cars which had no wheel guards attached. In all of the fender tests, whether the action of the fender was good or bad, the dummy was invariably picked up, thrown off or jammed beneath the fender in such a manner that a wheel guard would not have been brought into use at all.

If the dummy is for the most part under the fender or wheel guard but still is partially picked up or removed from the track, a test grade of "C," counting two points.

If the dummy is entirely under the fender or wheel guard, but is dragged sufficiently to prevent its going under the car or wheel, a test grade of "D," counting one point.

If the dummy passes under the car or wheels, the test is

a failure, and the test grade is "E," counting 0 points.

In all of the tests the fenders were attached to double-truck cars to conform to local conditions. Tests were made both on pavement and on graveled roadway. For the upright position a wooden dummy 5 ft. 6 in. high, weighing 76 lb., was used, and for the prostrate positions there were employed three dummies stuffed with a mixture of sand and sawdust, and one wooden dummy. This wooden dummy weighed 100 lb., while the three stuffed dummies weighed 50 lb., 80 lb. and 130 lb. respectively and ranged in height from 5 ft. to 5 ft. 6 in.

DESCRIPTIONS OF WHEEL GUARDS AND FENDERS

The Pogue fender is arranged to be tripped automatically, but is also provided with an attachment for operation by motorman. The automatic trip extends 8 in. ahead of the fender and when pushed in toward the fender catches are released so that it is allowed to drop to the rail. For hand operation a plunger extending to the vestibule platform can be pressed down by the motorman to release the catch which holds up the fender. This fender has a framework of iron pipe and the apron and guard are made of 4-in. wire mesh linked together so as to form a loosely hanging basket within the fender frame. The dimensions follow:

Weight.....	145 lb.
Distance between the edge of fender and car bumper.....	4 ft. 1 in.
Distance between the lowest point of fender and top of rail.....	7 in.
Vertical distance between the highest point of fender and top of rail; normal position, 4 ft.; when down on rail.....	3 ft. 11 in.
Width of fender over all, transversely.....	6 ft. 0 in.
Width of fender over all, longitudinally.....	2 ft. 9 in.
Distance from trip to fender.....	8 in.

The Hudson-Bowring wheel guard consists of a flat apron attached under the car just ahead of the forward truck. The apron is held in the raised position by a rod and toggle to a tripping gate or buffer carried on the pilot board. When the gate meets an obstruction it swings inward, tripping a catch which releases the apron. The dropping of the apron to the rails is accelerated by the action of a spiral spring. The apron can be reset by the motorman by the use of a lever in the vestibule. The main dimensions of the Hudson-Bowring wheel guard follow:

Weight.....	166 lb.
Distance behind bumper to trip.....	5 1/2 in.
Distance behind bumper to edge of guard.....	4 ft. 2 in.
Distance from trip to guard.....	3 ft. 8 1/2 in.
Distance between the lowest point of trip and top of rail.....	5 1/2 in.
Distance between the lowest point of guard and top of rail.....	7 in.
Width of guard over all, transversely.....	6 ft. 6 in.
Width of guard over all, longitudinally.....	21 in.

The Nelson fender is operated by air pressure, both when automatically tripped and when released by hand. When tripped in either manner the air pressure thrusts fender and guard vertically to the rail, at the same time applying the air brakes of the car. The appliance for operating the device manually is attached to the motorman's brake valve, and this appliance can also be used for releasing the brakes should they be applied automatically so tightly as to skid the wheels. The main dimensions follow:

Weight.....	177 lb.
Distance between the edge of fender and car bumper.....	3 ft. 1 in.
Vertical distance between the lowest point of fender and top of rail in running position.....	7 in.
Vertical distance between the highest point of fender and top of rail in normal position, 3 ft. 6 in.; when down on rail.....	2 ft. 11 in.
Width of fender over all, transversely.....	6 ft. 6 in.
Width of fender over all, longitudinally.....	2 ft. 5 in.

The Watson wheel guard consists of a steel apron attached under the car body and just ahead of the forward truck, the apron being locked in position so as to be tripped by a gate or bumper swung from the car sills. At the same time that the catch supporting the apron is tripped compression springs are released which thrust the apron down and hold it against the rails. The dimensions are:

Weight.....	179 lb.
Distance behind bumper to trip.....	5 1/2 in.
Distance behind bumper to edge of guard.....	4 ft. 2 in.
Distance from trip to guard.....	3 ft. 8 in.
Distance between the lowest point of trip and top of rail.....	4 ft. 5 in.
Distance between lowest point of guard and top of rail.....	4 ft. 1/2 in.
Width of guard over all, transversely.....	6 ft. 0 in.
Width of guard over all, longitudinally.....	22 in.

The Watson fender consists of a flat apron and bumper with an automatic trip attachment in the form of a projec-

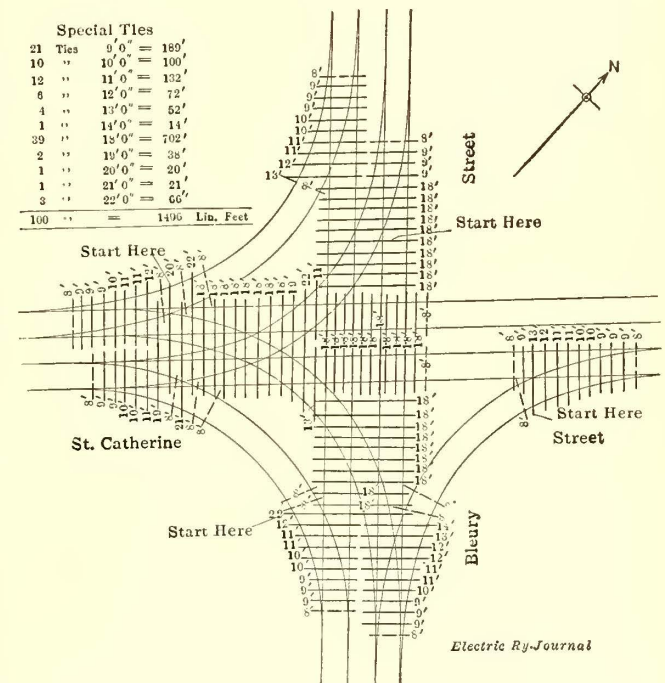
tion on the apron. This projection slides back when it strikes any object on the track and releases the catches which hold the fender in normal position. The action of dropping the apron to the track is accelerated by springs. The dimensions of the Watson fender follow:

Weight.....	255 lb.
Distance between the edge of fender and car bumper.....	4 ft. 1 in.
Distance between the lowest point of fender and top of rail.....	7 in.
Vertical distance between the highest point of fender and top of rail, normal position.....	4 ft. 0 in.
Vertical distance between the highest point of fender and top of rail, when down on rail.....	3 ft. 11 in.
Width of fender over all, transversely.....	6 ft.
Width of fender over all, longitudinally.....	2 ft. 9 in.
Distance from trip to fender.....	10 in.

TRACK IMPROVEMENTS AT MONTREAL

The year 1912 was a very active one for the way department of the Montreal Tramways Company, as the removal of overhead railway and non-railway wires from St. Catherine Street offered a good opportunity for rehabilitating the track on this, the most important street of Montreal. At the same time the company obtained the right to place tracks on Dorchester Street, in order to relieve St. Catherine Street, to which it is parallel. In all, therefore, about 40 miles of new track have been placed on these and other streets during the past two years.

The track taken up was largely on solid concrete foundation with steel ties spaced 6 ft. centers. There was also some track with no ties at all, also on concrete founda-



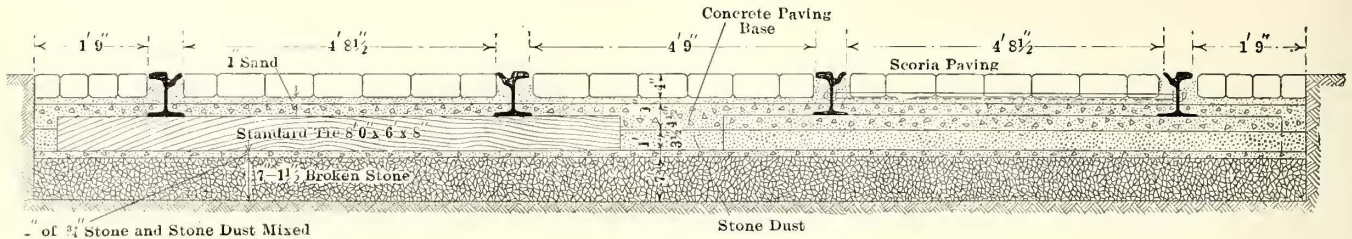
Montreal Track Improvements—Layout of Special Ties for St. Catherine Street and Bleury Street

This construction had proved very noisy and was believed to cause corrugation, the rail quickly wearing its way into the concrete base and destroying adjacent paving. The new construction, as adopted in 1912, called for a sub-base of concrete, but owing to time limitation and the difficulty of keeping traffic from the street for so long a period, the work for 1913 was carried out with a sub-base of broken stone. This sub-base has been found superior to Then the ties are placed and brought to grade by tamping concrete as it is less noisy and permits better drainage. A cross-section of the latest construction is shown in an accompanying drawing.

In laying the new track the sub-grade is thoroughly rolled with an 8-ton steam roller upon which is placed 1 1/2 in. of broken stone to a depth of 7 in., which is also rolled.

on a 1-in. layer of fine stone and stone dust mixed, which is also carried up another 3½ in. at the sides of the ties. This dust cushion carries 4½ in. of concrete and a 1-in. base of sand for scoria block, 4 in. deep, or Laurentian granite paving, these being grouted with a 1 to 2 mixture of cement and sand. A good feature is the use of 8-ft. instead of

Details of this basin are shown in an accompanying drawing. It has proved so satisfactory, especially in ease of cleaning, that the railway company has adopted this basin as standard. About 150 are now in use or on order to replace iron drains. The basin is constructed with a concrete base and a cast-iron cover grating. It is installed



Montreal Track Improvements—87-Lb. T-Rail with Scoria Paving, Showing 8-In. Stone Ballast Under Ties

7-ft. ties of jack pine or cedar, space 2-ft. centers. The longer ties cost no more and give an extra bearing which easily justifies the greater amount of excavation. The rail is a special Lorain section, designed for the Montreal Tramways Company and known as 115-462. It is similar to section 116-434 except that the bevel in the head has been increased, thus making the tread narrower to suit the Montreal Tramways Company's standard wheels. The tie rods are spaced 6 ft. center to center. These bonds were adopted during 1910 to succeed the plug type. The Montreal company was one of the early users of cast-welded joints but did not meet with success with them, as Montreal is subject to a temperature range of 30 deg. below zero to 95 deg. above. The last cast-welded joints were removed in 1912.

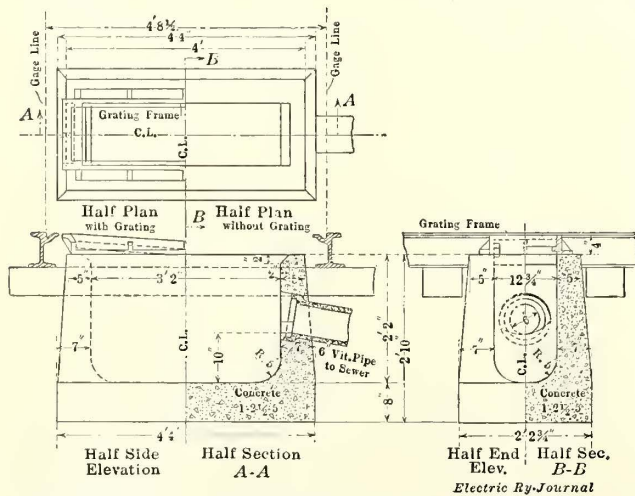
TIES FOR SPECIAL WORK

Some years ago a great deal of special work was installed on a solid concrete foundation without ties and some on standard 8-ft. ties interlaced, but both types proved unsatisfactory, particularly the former. All new intersection work is now placed on 8 in. of crushed stone and special 6-in. x 8-in. ties from 8 ft. to 22 ft. in length of tamarack, hemlock or spruce. This construction, although expensive, is found to enhance the life of the steel work to a large extent besides more uniformly keeping the pav-

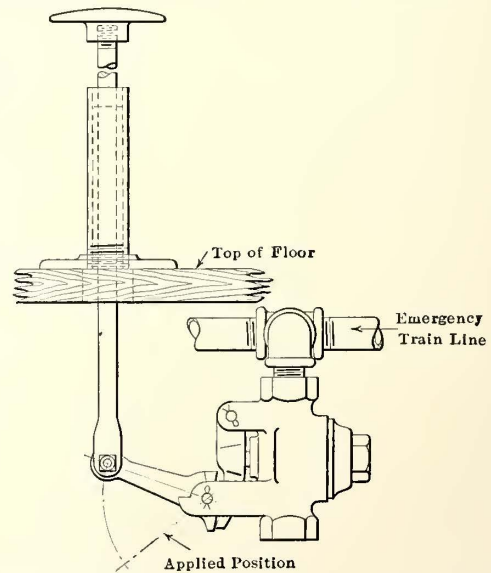
between the rails as illustrated, the cover being sloped instead of crowned in order to provide a better catch-all. This cover is also provided with a special piece when made for installation with T-rail. The grating may be readily removed so that the basin can be cleansed quickly with a shovel instead of by the slower way of spooning. The devil-strips are crowned so as to pitch toward the basins. The side of the basin is fitted with a 6-in. vitrified pipe trapped to the sewer to carry off all silt as well as snow melted by the heat from the sewer.

MORE ARTICULATED CARS FOR BOSTON

The Boston Elevated Railway placed in service early in October forty-one additional cars of the articulated type on its Milton-Park Street subway cross-town line. These cars are similar to those of the previous type described in the ELECTRIC RAILWAY JOURNAL for Oct. 5, 1912, and were built in the company's own shops from the designs of John Lindall, superintendent of rolling stock and shops. Each of the new cars is composed of two 20-ft. bodies, with a central compartment. A new feature of these cars is the provision of a conductor's emergency foot valve by which



Montreal Track Improvements—Catch Basin for Track Drain



Foot Valve for Emergency Brake of Boston Articulated Cars

ing and joints in good condition. A similar plan is used by other companies, but the practice is far from common.

CATCH BASIN FOR TRACK DRAIN

At the request of the municipality of Maisonneuve, R. M. Hannaford, assistant chief engineer Montreal Tramways Company, designed a concrete catch basin for track drainage in some of the streets laid with granolithic paving.

the air brakes can instantly be applied from the central compartment in case of trouble. The arrangement of the foot valve is shown in the accompanying drawing. The earlier cars of this type were provided with an emergency brake valve for the conductor's use, but this was arranged only for hand operation. On the later cars the conductor is provided with a change box to facilitate handling fares.

Westchester Electric Railway Building for Employees

New Building Recently Opened in Mount Vernon—Contains Billiard Room, Lunch Room, Library, Assembly Hall, Shower Baths and Other Features of Interest to Employees

The Westchester Electric Railway, Mount Vernon, N. Y., which is controlled by the Third Avenue Railway, New York City, recently opened a new building for its officers and employees at 219 South Fifth Avenue, Mount Vernon. This new building, which is similar to one opened at the

with the exception of the tile floor in the vestibule and entrance hall and the concrete floor in the shower bathroom and toilet. Marble is used for the lower part of the side walls in the vestibule and entrance hall and for the treads and platforms on the stairway to the second story.

The most striking feature about the building is the amount



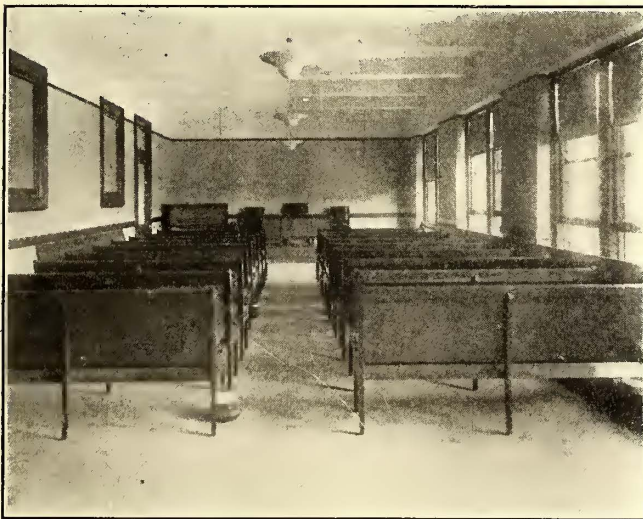
Westchester Electric Railway—Employees' Building at Mount Vernon, N. Y.



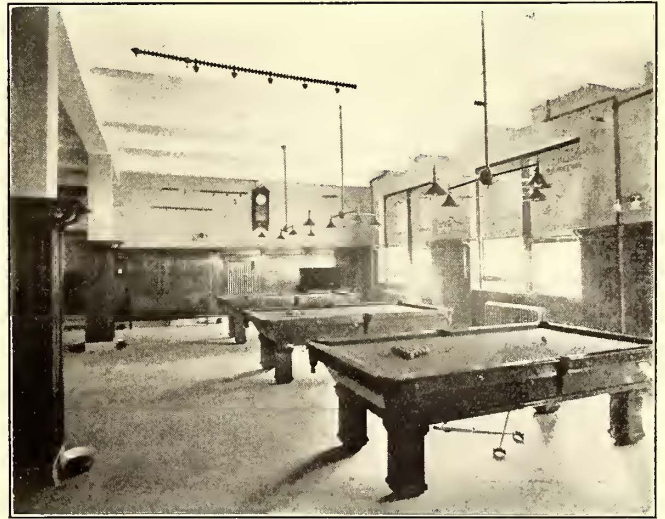
Westchester Electric Railway—Library and Reading Room in Employees' Building

same time in Yonkers, N. Y., for the employees of the Yonkers Railroad, is an excellent example of the various measures instituted by Frederick W. Whitridge, president of these companies, for the comfort and welfare of the employees.

of space reserved in various ways for the employees as compared with that set aside for official use. Approximately two-thirds of the entire floor space in the building is devoted to employees' uses, as is indicated by the accompanying floor plans and illustrations. These clearly show



Westchester Electric Railway—Assembly Hall in Employees' Building



Westchester Electric Railway—Billiard Room in Employees' Building

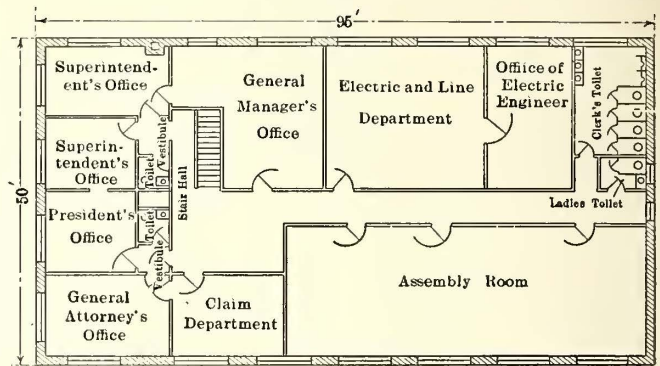
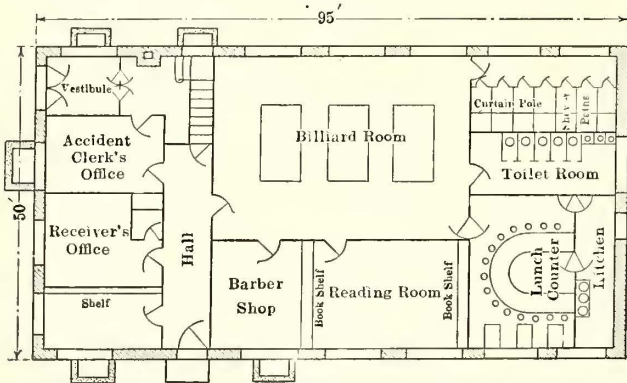
The building, shown in the accompanying illustration, is 50 ft. x 95 ft., two stories high, and is constructed of brick. The front is light-brown brick, with bluestone foundation, window bases and lintels and coping. In the interior the woodwork is of light oak. The entire first floor is terrazzo,

that the recreation and enjoyment of the employees were the prime motives leading to the construction of the building.

The ground floor contains several features that have met with the hearty approval of the men. In the rear of the

marble hall is a spacious billiard room with three standard billiard tables and all the necessary accouterments. Behind the billiard room there are located seven shower baths, whose white cleanliness and inviting features have proved a great boon to the stream of hot and dusty motormen and conductors at the end of the day's run.

department. The remainder of this side of the building is occupied by the assembly room, which is the chief feature on this floor of interest to the employees on the standpoint of recreation. The room is fitted up with oak benches, rostrum and piano. In the rear there is a stereopticon, with which the company intends to pursue the plan followed in



Westchester Electric Railway—Plans of First and Second Floors in Employees' Building

On the right-hand side of the first floor, as one enters the vestibule, are found the accident clerk's office and the receiver's office, where the men are paid off. Across the hall behind these rooms there is a room which is to be used as a barber shop, and behind this is a library. Works of both technical and non-technical nature may be found herein, together with current newspapers and periodicals, and additions will be made to the files and catalogs as rapidly as time allows. The rear right-hand corner of the building is taken up by the lunchroom. This at present is reserved for the use of the men actually employed in the building, but it is the purpose of the administration to throw it open to the outside employees as soon as adequate provisions can be made for such a move. The lunchroom contains a curved lunch counter, with eighteen stools on the outside, and also four wall tables. Back of the lunchroom is the kitchen, containing a gas range, a refrigerator, coffee and tea tanks and complete culinary fixtures.

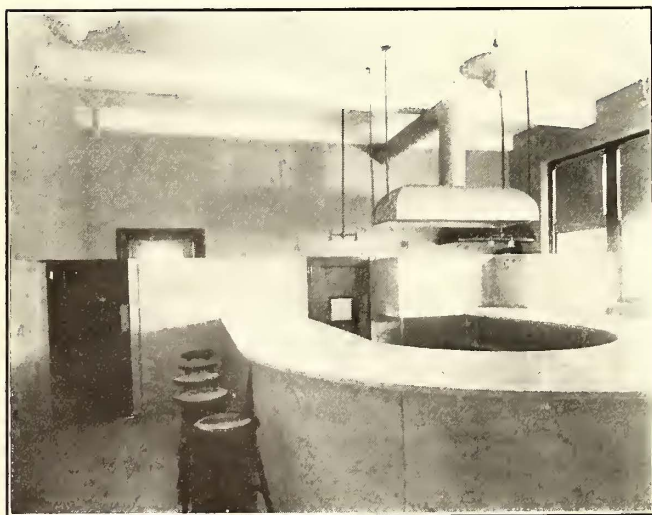
The second floor of the building contains the offices for

recent years of giving occasional entertainments and lectures for the benefit of the men and their families. The room also lends itself admirably to dance purposes.

The building stands on a plot of ground which adjoins land owned by the railway. This gives a permanent assurance of good light and fresh air for all the rooms. It is true that, although it is on one of the principal streets in Mount Vernon, the building is a considerable distance from the carhouses and terminal in that city. This, at first, might be construed as a vital disadvantage, but this is not the case, owing to the peculiar local conditions existing. The homes of the approximately 350 employees of the company are almost evenly divided between Mount Vernon and New Rochelle, and the location of the building on one of the main lines of the Westchester division between these cities makes it equally accessible to both sections. In addition to this fact, it is not improbable that a future development of the company's plans may mean the removal of the carhouses and terminal to the new locality.

President Whitridge made some remarks in connection with the opening of this building that well illustrate the attitude of the company in desiring to help the employees. He told the men that the legal relation existing between the officers of the company and themselves was that of fellow servants of the public and the personal relation not that of partners but of master and servant. He continued:

"There is in this, however, nothing to prevent mutual respect and the warm human fellowship that fellow service ought to create. The formation of the employees' association and the opening of these club rooms are intended to show that such sympathy does really exist. Antagonism between us is unreasonable and impossible, and we are not likely to have a repetition of strike troubles such as we had in Yonkers last January, for the employees of the company understand me better now."



Westchester Electric Railway—Lunch Room in Employees' Building

the various company officials. The front is given over to those of the president, superintendent and general attorney. Next on the left come the rooms devoted to the general manager, the electric and line department and the electrical engineer of the company. On the right, behind the general attorney's office, is situated the office of the claims

According to an English contemporary, the London & Northwestern Railway Company has under consideration the model of a signal device for bringing to a stop any train which has passed a signal at "danger." The appliance is said to be simple, and it is stated that it can be worked very economically and without any expensive addition to the existing signal plant. It is intended to be attached to the present type of signal, and consists of an arm extended from the standard over the rails. Attached to the arm is a swinging disk, which, when a signal is in the stop position, comes into contact with the corresponding disk on the cab of the engine, automatically applying the brake and bringing the train to a stop.

Meeting of Railroad Commissioners

Abstracts of the Reports of the Committees on Railway Capitalization and on Railroad Taxes and Plans for Ascertaining Fair Valuation of Railroad Property—The Discussion During the Opening Sessions—
The Bureau of Standards and Its Investigations of Electrolysis

The twenty-fifth annual convention of the National Association of Railway Commissioners, which was held in Washington this week, was largely attended by representatives of railroad and public service commissions of the country. In addition to the usual program of committee reports, bearing mostly upon railroad questions, papers were read upon various aspects of the subjects of regulation. The presence in Washington of representatives of so many of the state commissions and their interest in the valuation of railroads by the Interstate Commerce Commission led to a number of conferences on this topic. The matter of valuation of railroads was more prominent in the formal and informal conferences than that of valuation of other classes of public utilities.

Edgar E. Clark, chairman of the Interstate Commerce Commission, made an address of welcome to the delegates, which was thought by many to indicate views favorable to an advance in railroad rates. Mr. Clark said it would be a mistake to try to correct past evils in railroad financing by a policy of reprisal which would impair the efficiency or usefulness of the carriers. An abstract of Mr. Clark's address is published elsewhere.

O. P. Gothlin, of Ohio, the president, called attention in his address to his action in appointing during the year a committee on valuation to represent the interests of the states before the Interstate Commerce Commission in the pending valuation of railroads. This committee was as follows: Mr. Thorne, Iowa, chairman; Mr. Martin, Kansas; Mr. Glasgow, Michigan; Mr. Erickson, Wisconsin; Mr. Henshaw, Oklahoma; Mr. Staples, Minnesota; Mr. Berry, Illinois; Mr. Clarke, Nebraska; Mr. Gothlin, Ohio; Mr. Maltbie, New York; Mr. Thelen, California; Mr. Atchison, Oregon; Mr. Richards, South Carolina; Mr. Bishop, Massachusetts, and Mr. Prentiss, Virginia. As part of the plan each state was requested to name a member to serve on a general advisory committee.

The report of the committee on railway capitalization was presented by John M. Eshleman of California, the chairman. It attacked the report of the Railroad Securities Commission appointed by President Taft and aroused prolonged and sharp debate. In the course of the discussion H. F. Bartine, of Nevada, a member of the committee, said that the report was written by Mr. Eshleman. He thought that Mr. Eshleman did not intend to criticize in the least degree the report of the Railroad Securities Commission, which was rendered at an earlier date than this, but that the world was moving and it was possible to go further now than then.

Commissioner B. H. Meyer, of the Interstate Commerce Commission, who was a member of the Railroad Securities Commission, also discussed the report. Mr. Meyer called attention to certain features of the report of the Railroad Securities Commission. With power to establish and value the public utilities on the one hand, and adequate power to regulate rates and service on the other, he thought that the question of regulation of stocks and bonds was largely a question of public morals. How best to promote and to achieve these public moral purposes was the object of all proposed stock and bond legislation; and that, he thought, was also the purpose of the report of the committee.

Among the amendments to the act to regulate commerce pending before Congress in 1910 was one aimed to control in certain respects the issuance of stocks and bonds of interstate carriers. Congress could not agree upon a definite program, as the result of which that matter was re-

ferred to a commission of five, of whom Mr. Meyer was one. That commission was directed to make a report upon this subject with a view of submitting suggestions that might assist Congress in enacting legislation at that time, namely, late in 1911 and early in 1912.

There were before the securities commission two broad fundamental questions: On the one hand, should the commission recommend to Congress legislation which would place the responsibility of the issuance of securities in the hands of the corporation, or should it take away from the corporation the initial responsibility and place it in the hands of the State, meaning, of course, state governments as well as the federal government? The securities commission decided in favor of the alternative of leaving the initial responsibility in the hands of the carriers and placing in the hands of the federal government adequate power, as was thought, to reach in when wrongdoing was in progress and to correct it if possible if it had been done. Mr. Meyer quoted a paragraph from the report of the commission which suggested the lines of thought which it had been considering as follows:

"If railroad securities were to be issued only after express authorization of each particular issue by the Interstate Commerce Commission or other governmental agency, it is difficult to see how the government could thereafter escape the moral, if not the legal, obligation to recognize these securities in the regulation of railroad rates."

Mr. Meyer suggested the possibility of the offer of public utility securities to prospective purchasers, accompanied by engraved certificates carrying the seal of the State. Continuing, Mr. Meyer said that the securities commission did not suppose for a moment that it was drawing up a program which would settle this question once for all, but it was agreed that this was one step that in good faith and with some degree of confidence of success it could recommend to Congress. It had in mind possible additional steps to be taken in the future, but that was a question for the future to take care of.

In the report of the committee on railway capitalization, the report of the Railroad Securities Commission had been represented as primarily passive. The theory of publicity had been represented as a passive theory. The Securities Commission recommended many things which it believed should be required, either directly by statute or supplemented by specific requirements in an administrative way by the Interstate Commerce Commission. After enumerating a good many of these things, the securities commission recommended that every railroad corporation should furnish to the Interstate Commerce Commission or other governmental authority, in addition to its income account, a balanced statement of receipts and expenditures on capital account and of the surplus or income accruing during the period, as well as of all other financial transactions that had taken place during the period, with whom had, whether in cash, in securities or in other valuable consideration.

Other recommendations were outlined by the securities commission looking to a degree of administrative supervision far in advance of anything now provided under the rather liberal provisions of the interstate commerce act. Mr. Meyer said this was scarcely to be characterized as a passive program. It was passive in the hands of passive commissioners who were unwilling or unable to do their work. It was active in the hands of active commissioners who knew their business and were willing and able to do their duty.

The report characterized the Wisconsin act as one of the best if not the best in the country. As a Wisconsin man, who not long ago was charged with one-third of the responsibility in the administration of that act, he fully shared in that view. But was it not rather significant that the Wisconsin member of the securities commission hesitated so much to extend the theory of that act over the whole country that he was unwilling to recommend to his colleagues on the securities commission the taking of this additional step? Not a single thing was done under the excellent Wisconsin act which could not have been accomplished under the act suggested by the securities commission without assuming moral or legal responsibility.

After lengthy further discussion the association adopted all but the fourth recommendation of the committee on railway capitalization.

OTHER PAPERS AND REPORTS

Lawrence B. Finn, chairman Kentucky Railway Commission, read a paper on the subject "Should Congress Extend the Power of the Federal Government to the Regulation of Intrastate Rates?" Discussion over the question of enlarged federal authority took place during two sessions of the convention and finally resulted in the passage of a resolution on Oct. 30. This action followed directly a statement made by Chairman Clark of the Interstate Commerce Commission, in which he made it plain that that commission was not seeking to extend its authority. It was not jealous of the authority of the states. It welcomed and solicited the widest degree of co-operation from all of the states. It had no desire other than to fulfil faithfully the obligations imposed on it by law.

The resolution which was adopted as the sense of the convention was then offered by Mr. Eshleman of California. It provided that no legislation by Congress attempting to extend the authority of the federal government over intrastate rates was either necessary or desirable at this time.

Abstracts are published below of the address of welcome of Commissioner Clark, the report of the committee on railway capitalization, a paper on the Bureau of Standards by Dr. Rosa, and the report of the committee on railroad taxation and valuation. The latter was accompanied by five communications. Abstracts of the paper on the Bureau of Standards and of the reports of the two committees mentioned above are published in abstract elsewhere in this issue. The report of the committee on railroad taxation and valuation says that the two remaining members of the committee did not submit their statements in time for them to appear in the printed report.

NEW OFFICERS AND DATE OF NEXT MEETING

The election of officers resulted as follows: President, Laurence B. Finn, Kentucky; first vice-president, Clifford Thorne, Iowa; second vice-president, Robert R. Prentis, Virginia; secretary, William H. Connolly, Interstate Commerce Commission; assistant secretary, William Kilpatrick, Illinois.

The next meeting will be held in Washington, D. C., beginning Nov. 17, 1914.

ADDRESS OF WELCOME BY COMMISSIONER CLARK OF THE INTERSTATE COMMISSION

We all occupy positions of tremendous responsibilities and are invested with unprecedented authority. Upon our zeal, patriotism, efficiency and judgment rests largely the commercial welfare of our country.

In this, as in other lines of public work, we find the extremists on both sides, who, unless their ideas are accepted and followed, exercise to its full extent the American's prerogative of criticism. Their criticism is often founded in lack of knowledge as to facts and sometimes in a willingness to disregard the rights of others. Such criticism creates misunderstandings and misconceptions, but if

we are not broad enough to refrain from being influenced or swerved by it, we are lacking in true capacity and fitness for the positions which we occupy.

The situation that existed when regulation was undertaken was permitted to grow up. State and nation could have prevented it. But it was a long time before public sentiment, which is really the power of the state and of the nation, awakened to the facts and roused itself to the task of establishing equity in place of gross and unjust discrimination, and law in place of license.

The multitude of evils could not be eliminated nor the wrongs corrected by one heroic action. Under the conditions that then existed such things grow rapidly and easily. The attempt to eradicate them involves the interests of many who had nothing to do with creating or fostering them, as well as the interests of the carriers whose agents, in co-operation with the representatives of favored ones, created and nourished the wrongs.

Even if it be true that the present financial condition of transportation agencies is due to reckless, improvident, or even dishonest, financing in the past, it would be a mistake to undertake to correct it by a policy of reprisal which will impair the usefulness or efficiency of the carriers upon which the welfare—the very life—of the commerce of the country depends. That commerce grows continually, and we have seen each year periods during which the available transportation facilities were sadly lacking in efficiency.

This is in part due to the failure of carriers to provide themselves with facilities, in part to inefficient handling and movement of equipment, in part to failure of shippers and receivers to provide room and facilities of their own sufficient for their needs, and in part to customs that have grown up in some lines of business that necessarily cause serious delay to cars and congestion of terminals. Of course, the ideal situation would be one in which the carriers were ready to provide all the equipment needed and promptly transport all the traffic offered at the time of the maximum demand, but that situation can be attained only by large additions to the facilities and great improvement in methods. The added facilities can be secured only through expenditures from surplus earnings or from expansion of credit. In either way the total cost to purchasers of transportation would be increased. It seems to me that no more helpful work can be done than to bring about the highest possible degree of efficiency in the operation and utilization of the facilities now possessed.

It seems to me also that the traveling public is justly entitled to a greater degree of safety while patronizing our railroads. The importance of this should be brought forcefully to the mind of every railroad official and every railroad employee. They should realize and respond to the great responsibilities which they have undertaken and be held to a strict accountability for neglect therein. It would be well to revive and enforce the old fundamental rule for train operation, "In case of doubt, take the safe side."

REPORT OF COMMITTEE ON RAILWAY CAPITALIZATION

There seems to be no dissent from the conclusion that stocks and bonds of railroads, as well as of other utilities, should be regulated; we will therefore discuss the question before us from the general standpoint of the regulation of securities of all utilities.

Were it not for the fact that the eminent body of men composing the Railroad Securities Commission has practically indorsed regulation by publicity, your committee would not consider it necessary to discuss such a method of regulation, which we believe utterly inadequate to produce the results demanded. In fairness to the report of the securities commission, however, it is proper to state that this commission gave as its main reason for reporting in favor of publicity as the proper method of regulating rail-

way securities the conflicting state laws and conflicting jurisdiction between state and federal authorities which might result in rendering a more stringent form of regulation ineffective.

When it is borne in mind, however, that more than half the states have no regulation on this subject and that of those that assume to regulate stocks and bonds of carriers one (Georgia) refrains from attempting to regulate such issues of interstate carriers on the ground that such state does not have jurisdiction thereover, and several others limit their regulation to domestic corporations and some do not require either of domestic or foreign corporations engaged in interstate commerce that they submit to state control when the moneys to be realized from the sale of stocks and bonds are to be expended without the state borders, it will readily appear that a very large field is not covered. It further appears that Arizona, California, Colorado, Illinois, Missouri and Pennsylvania have for the first time attempted to regulate the securities of interstate carriers since the presentation of the report of this securities commission. Therefore, at the time of the presentation of this report the effective regulation of interstate carriers by state authority was limited to a comparatively few states.

Another reason for the conclusions of this national commission against affirmative regulation by the federal government of stocks and bonds of interstate carriers was the fact that important cases were then pending before the Supreme Court of the United States, the decision of which cases in the opinion of this commission might be determinative of the power of Congress to act in this field. Since this report the Supreme Court of the United States has decided the cases referred to, and has made it more apparent, as your committee believes, that if Congress chooses it may assume jurisdiction over at least a considerable portion of the field we are here considering. While it may be that the Supreme Court of the United States will hold that it is within the power of any state to control liens on property of interstate carriers located within the boundaries of such state and that the state chartering the corporation still may retain its power to regulate the stocks and bonds of such corporation even though it operates without the state chartering it, yet we are quite sure that a state may be prevented from regulating the stocks of an interstate carrier chartered by another state, and certainly by the federal government, and that it may be prevented from regulating issues of bonds that do not constitute a lien upon property within the state involved.

It is our general opinion from a somewhat careful consideration of the law on this subject that no one is competent to advise what the Supreme Court will do with reference to the powers of the states to regulate stocks and bonds of interstate carriers until Congress has passed legislation assuming such authority in the federal government and the Supreme Court of the United States has passed thereon.

We are not at all sure that it is necessary under constitutional provisions as they now stand to resort to a federal incorporation act in order to subject interstate carriers to regulation by federal government as regards their stocks and bonds. It is to be regretted that the federal securities commission did not report on this subject.

We have it dinned into our ears that the public is a partner with the public service corporation, but we doubt if this idea is as fully and sincerely accepted as it should be. Not only is the public a partner in the business, but it has come to be and is and must be recognized henceforth as the dominant partner. This merely affirms that the public interest is superior to the private interests. This is not a fitful movement of the moment. We are witnessing a new order of things throughout the United States. The last decade in American history is the story of the assertion of the human right above the property right and the property of individual men is being made to serve the purposes of the community of men. Nor has there been aught of con-

fiscation in this movement. Those who once believed that this was a passing whim no longer deceive themselves. The public has asserted and will continue to assert even more vigorously than it has in the past its right to the dominant partnership in public utility enterprises.

If we should attempt to name the one factor which has been most productive of financial troubles and which has contributed most to the necessity for regulation, we would have no hesitancy in saying that it has been the design of the men promoting and controlling utilities to make somebody take the risks when they themselves take the chances of profit, and not even to-day when utilities are supposed to be very much reformed do we find stockholders adverse to getting their stock for nothing and taking the chance that value may be placed behind it out of the rates which the utility will be permitted to earn.

It may be a serious thing when a utility already overburdened and mortgaged beyond its value finds itself unable to secure the necessary funds to make the proper repairs and extensions mentioned, but to say that such utility must be permitted further to burden itself seems to border on the ridiculous. When the finances of a corporation are in a bad way, such corporation should not be permitted to borrow more money and to increase its indebtedness. A tottering concern should be saved by its stockholders and not by its rate payers. This seems to us so plain that it is difficult to understand how any difference of opinion could exist with reference thereto. It is a practice which is uniform with reference to all kinds of business except a utility.

The salvation of any property is more to the benefit of the owners of that property than the patrons thereof. It is utterly immaterial to the user of gas or the purchaser of railroad transportation who is the owner of such utility, and a change in ownership or control in the ordinary course of affairs does not affect the patron in the least as far as the mere substitution of ownership is concerned. Neither should the change in ownership necessitated by the financial difficulties of a public utility owner affect the patron of such utility. Nor should receivership and consequent reorganization on a different financial plane injure the consumer but rather aid him by putting in control of the agency serving him those better able from a financial standpoint to serve him.

In short, the only persons interested in the maintenance of the property interest in a utility by the present owners of such utility are such property owners, who, of course, are the stockholders, when a utility, as is usually the case, is a corporation, and these stockholders should be called upon to save the utility property if the ownership is to be retained by them, it being immaterial to the rate payers or the public generally in whom the title to utility property rests; and the stockholders reaping all the benefit of the continued ownership in them should be the ones to furnish the means required to continue such ownership.

Our conclusions are that regulation of securities of utilities is demanded on the following grounds:

1. The protection of the investor. We consider this of least importance, but laws preventing frauds, particularly wholesale frauds, have always met with favor, and if the laws requiring the regulation of public utility securities performed nothing more than this least important function, we believe that such public regulation would be justified.

2. Protection of the utility. If we were dealing always with the corporate entity, which in its corporate capacity could realize its own needs, our problem would be much simpler, and it would be correct to say, just as is often urged, that the interest of the corporation induces it to resort to sound financial methods, in order to obtain from the sale of its stocks and bonds the very largest amount possible to obtain, and to place the proceeds in the treasury of the corporation for its benefit. But corporations are handled by men, and admittedly the history of corporations, and utility corporations particularly, has been a history too

often of conflicting interests between men and the agencies which they represent.

3. Protection of the patrons of the public utility. We have called attention to the fact that the public is the partner of the utility. By reason of this fact the public cannot permit the stockholders and their representatives, the officers of the company, who stand in the place of the other partner, the corporation, to have the entire say as to the financial affairs of such corporation, because, just as it is too often the inclination of the representatives of the stockholders to favor their own interests when such interests conflict with the interests of the stockholders, so the inclination both of the stockholders and their representatives, the officers of the corporation, is to favor the interests of that partner when they conflict with the interests of the other partner, the public.

Your committee agrees generally with the provisions of the model act of the National Civic Federation, but we believe that not quite enough discretion is allowed to the commissions, particularly with reference to the selling price of stocks and bonds. We advise against writing into the law the amount for which stocks and bonds shall be sold; a better method would be to repose more discretion in the commissions, particularly as regards the selling of stock below par, so as to enable the commissions, when they are confronted with a condition where a utility is not insolvent but still so heavily in debt that it should not be permitted to raise more money from bonds and likewise cannot secure its par from stock, to permit the sale of stock to a limited extent below par, so as to bring back the margin of safety and restore the credit of the utility rather than allow excessive debt to impair its service and drive the utility into the hands of a receiver.

COMMITTEE'S RECOMMENDATIONS

We do not believe it necessary for the purpose of this paper to recommend any particular form of an act but we do believe that we should recommend the minimum which should be provided, and this minimum we believe should be the following:

1. The limitation in the act of the purposes for which the issue of stocks and bonds shall be permitted.

2. Authority to the commissions to see to it that the proceeds of the sales of stock and bonds are devoted to the purposes for which they are issued.

3. No stocks or bonds to be issued without the positive approval of the commission, or at least a veto power should be reposed in the commission similar to the power which the Interstate Commerce Commission has to suspend rates. If this method is pursued, the same full investigation should be required on the part of the commission in every instance as is required when the affirmative action of the commission is provided for.

4. No limitation in the statute as to the amount for which either stocks or bonds shall be sold.

5. The power should be reposed in the commission to impose conditions and to grant the application of the utility either in accordance with such application or in lesser or greater amount, and to impose such other conditions as the commission shall deem necessary.

6. Regulation of the stocks and bonds of interstate common carriers to be delegated to the Interstate Commerce Commission.

Basing our recommendation upon the foregoing conclusion, your committee respectfully recommends that Congress immediately pass an act empowering the Interstate Commerce Commission to regulate the stocks and bonds of interstate carriers in the manner and to the extent hereinbefore outlined.

The finances of all utilities, but particularly of the tremendous agencies engaged in interstate commerce, have been a pawn of the manipulators who demonstrably are more interested in gain than in the proper service to the public, and such service, as conclusively appears from his-

tory, is merely incidental to their main design. The design is to make money, and it grows out of natural inclination. There these financial magnates sit apart, building tremendous fortunes, nominally in control of great enterprises, but really delegating the control to others who are prevented from doing that which they would do by the very financial manipulations of their superiors, who are their superiors only in prevention and not in co-operation. The great financial interests and not the active railroad managers have been found to be responsible for most of the mismanagement of railroad enterprises.

RELATION OF BUREAU OF STANDARDS TO STATE COMMISSIONS

Edward P. Rosa, chief physicist Bureau of Standards, read a paper in which he referred to methods of testing the quality of gas. He also referred to the studies which the bureau had made of the electrolytic corrosion of gas and water pipes and lead cable sheaths by earth currents due to electric railways. He said that in the course of this investigation the engineers of the bureau had made field examinations in many cities, both large and small, and with the co-operation of the gas, water, telephone and railway companies had examined the pipes and made electrolytic surveys of earth currents. Continuing he said in part:

"A complete system of electrolytic mitigation has been worked out for two cities and is being put into operation. The work has progressed far enough to demonstrate that the method may be successfully applied in many cases. This is a matter of great practical importance because hundreds of millions of dollars' worth of underground pipes and cables are subjected to damage by electric railway current, and the bureau believes that the public service commissions can render a great service by seeing that the railways take such precautions as to reduce this damage to a minimum.

"Such questions should be kept out of the courts entirely, and the bureau believes that when the engineering aspects of the subject are better understood street railway companies will generally be ready to co-operate with the public service commissions and to remove, as far as possible, the cause of the trouble. In two of the cities studied by the bureau it was found that the saving of electric power effected by the methods of mitigation proposed was enough to pay a fair return on the entire cost of the changes and new construction required, and the systems will be in better operating condition for the change. The work was conducted as a scientific investigation, although it was done in a thoroughly practical way and all conclusions verified by frequent reference to working conditions."

Another investigation of great practical importance recently undertaken by the bureau, according to Mr. Rosa, was on the live hazards of electrical work. The bureau hoped soon to place some of its preliminary results along these lines in the hands of the public service commissions. The bureau is also conducting an investigation into the test of instruments used in electrical measurements.

In referring to the facilities possessed by the bureau Dr. Rosa said that one of the most serious objections that had been urged to the regulation of public utilities by commissions was that if the same rate of return on the capital invested was allowed to all companies it removed in many cases all incentive to enterprise, hard work and economy on the part of the responsible officers of utility companies, and that in consequence both the public and the stockholders were losers and great injury was done the industries. He admitted that as yet there was so little experience with rate-making that one could not say perhaps whether this had already occurred in some degree or not. Nevertheless, it was a tremendously important consideration and should not be ignored. Dr. Rosa then called attention to the fact

that the California Legislature had recognized the importance of the matter and had provided for it in the public utility act of 1911, by enabling the commission so authorized to make any arrangement it might deem wise with a public utility to encourage economies, efficiencies and improvements. The Idaho bill and the Pennsylvania bill also contained clauses of the same character. Continuing, he suggested that as few state commissions could maintain engineering staffs the Bureau of Standards could co-operate effectively in this work so as to utilize their combined resources most efficiently, and with the federal government assisting and co-ordinating the work, it was possible that standards of economy and efficiency could be set and operating data determined that would be of vast service, not only in enabling the commissions to act more intelligently and more justly but also in securing greater uniformity of action among the various commissions. The bureau hoped to be in position soon to do something in this direction.

Finally, he said that the relation of the Bureau of Standards to the public service commissions was unlike that of the Interstate Commerce Commission in some respects and like it in others. He believed that there was an immense opportunity for usefulness in assisting to solve some of the problems presented by the public utilities, co-operating in this work with the state commissions and assisting them as far as possible to get full and reliable information, but not assuming any responsibility that belonged to them nor interfering in the slightest degree with their freedom of action. The bureau would thus serve in some measure as a clearing house for technical information and in some degree as an agency for scientific and engineering investigations.

REPORT OF THE COMMITTEE ON RAILROAD TAXES AND PLANS FOR ASCERTAINING FAIR VALUATION OF RAILROAD PROPERTY

We suggested to the executive committee that the usual course of committee work be varied and that our committee be authorized to secure the preparation and distribution of several papers upon important phases of valuation work for discussion at this convention.

In submitting these papers, the committee does not express approval or disapproval of the ideas expressed therein. So far as statutes and court decisions have established rules, they must be followed by administrative bodies until repealed, amended or modified, but whatever may be the decisions of legislatures, courts or commissions, in the last analysis they must be based on sound economic principles or they will not persist.

The persistence with which an expression will obtain, though open to criticism, is well illustrated by the rule that rates may not be reduced by governmental authority below what will be sufficient to allow a fair return upon the fair value of property used in the public service. Value in ordinary usage and in economic parlance is determined by the return to be obtained in the future. Applied to a public utility, the principle means ordinarily that the value of an undertaking is determined by the money profit which can be made from such utility in the future. Now, it is evident that the return which may be derived is largely dependent upon the rates which may be charged. Hence, if the rates are under discussion and the problem is what should be a fair rate for the service rendered, it is obvious that one is reasoning in a circle; if rates determine value, it is obviously unsound to say that value is to determine rates.

It must be assumed, and we think it is conceded, that the courts in giving their approval to the principle that rates must be sufficient to yield a fair return upon fair value did not intend to approve the unsound principle that in fixing value one should include any factor which is determined by earnings or rates, but rather that fair value

should be fixed in a logical way and independently of the rates which were being considered as to reasonableness.

The situation would be greatly simplified and many of the problems which have aroused such discussion could be dismissed if the courts had adopted, or were to substitute, the word "amount" for "value." It is true that "amount" has not a definite or positive meaning, but the word "value" has been robbed of its ordinary meaning, and has been used in so many different ways that it is not of much assistance in solving the problem of the reasonableness of a given rate. The Supreme Court of the United States has repeatedly announced that no one factor is determinative, but that various factors must be considered. If each case must be considered upon its merits, and if a number of factors are to be considered and a decision based upon all, it follows that a general term, such as "amount," would be much more satisfactory and as full of meaning as the word "value," the ordinary meaning of which is not accepted, and as to which an explanation and apology must be made whenever it is used.

PAPER BY MAX THELEN OF CALIFORNIA

The first paper in the report of the committee, written by Max Thelen, commissioner and attorney California Railroad Commission, was on the subject of "A Just and Scientific Basis for the Establishment of Public Utility Rates, with Particular Attention to Land Values." A brief abstract follows:

It has been said that original cost, including betterments and additions, should not be used as a basis for utility rates, for the reason that it is often difficult to ascertain original cost. This objection goes not to the correctness of the principle, but to the difficulty of applying it in a given case. It is true that in the eastern and to some extent the middle western sections of this country it is often impossible to ascertain the original cost of public utilities. In such case the courts and commissions should strive to ascertain as nearly as they can what the original cost reasonably should have been. A number of commissions in applying the reproduction test ascertain as nearly as possible what the work reasonably should have cost under the conditions under which it was actually performed. If it is impossible to ascertain the unit prices and the conditions under which the work was originally performed, it may become necessary to ascertain reproduction value less depreciation as of the time when the rate inquiry is held. In doing so, it should be clearly borne in mind that this is being done not because reproduction less depreciation is the proper ultimate basis, but because it furnishes in the particular case the best available evidence of what the original cost reasonably should have been. If we bear this fact clearly in mind, we shall not rush into the dangers which ensue from the use of the present value or reproduction value test, without clearly understanding its significance.

It has frequently been urged that a public utility is entitled to a return upon the present value of its property or upon the reproduction value thereof, for the reason that it has title to the property, and it has been argued that a failure to give a public utility a reasonable return upon the property to which it has title would be to confiscate its property in violation of the Fourteenth Amendment to the federal Constitution. This conclusion overlooks the relationship between the public and the utility and is based on the erroneous assumption that title is the basis of a fair return in public utility cases.

The reason why a private citizen buying land is entitled to the unearned increment while a public utility acquiring land is not so entitled is that the citizen is performing no function of government and is not acting as an agent of the government, while the utility owes its entire existence and right to operate to the action of the state in conferring upon it certain of the powers of government, such as the right to use the streets and to take private property, to be used in the pursuance of its agency.

Commissioner Maltbie, of the New York Public Service Commission of the First District, has clearly seen the difficulties arising out of appreciation of values and has tried to avert the danger by considering appreciation in values as income and balancing it against depreciation in other kinds of property. However meritorious this theory may be, the Appellate Division of the Supreme Court of New York, in the case of *People ex rel. Kings County Lighting Company vs. Willcox*, decided on May 9, 1913, refuses to adopt this view.

Mr. Thelen suggested that in making physical valuations of utility properties and making their findings thereon the commissions should confine themselves to findings on questions of fact and refrain wherever possible from finding as to the ultimate question of value. This is the policy pursued by the California commission. The commission accumulates all the facts and makes its findings on them, but refuses to make a finding on the ultimate question of the value of the property. That value may be one sum for one purpose and another sum for another purpose. The correct value depends fundamentally both on the purpose for which it is to be ascertained and on the correct principles to be adopted in ascertaining it. Until the Supreme Court of the United States has clearly and unequivocally established the principle which it considers correct after its attention has been squarely drawn to the tremendous importance of the question of appreciation in value, Mr. Thelen believed it would be far wiser for the commissions to adopt the policy which the California commission is at the present time pursuing.

PAPER BY GEORGE A. HENSHAW, OF OKLAHOMA

George A. Henshaw, member Oklahoma Corporation Commission, read a paper on "Elements of Appreciation in Railroad Valuations." An abstract follows:

The items of unearned increment of right-of-way and solidification of roadbed are not carried in capital account. In the uniform classification of road and equipment accounts, all additions and betterments are charged to capital account, which only means additions and betterments for the acquisition of which an original expenditure is made.

There has been much discussion as to whether the unearned increment of right-of-way and the solidification of roadbed should be considered in ascertaining the value of railroad property for rate-making purposes, or should the public share in at least a portion of all increase in property which was a result of the development of the country?

The paramount question is: To what extent could the value of adjoining property affect the value of terminal grounds and rights-of-way? Without the railroads, the adjoining property would be worth but little, and without the cities and adjoining properties, the right-of-way would be worth but little. The value of one is interdependent upon the other.

Mr. Henshaw's conclusions were that there must be a limit to the increased values of right-of-way because of the building of large cities, or the particular location of a railroad. What that limit is must be determined by the rules of equity; that is, what is fair to the carrier and what is fair to the public. What he meant to emphasize was that the value of right-of-way and terminal grounds in large cities is not without limit as compared with value of adjoining property when the value or use of the adjoining property depends on the existence of the railroad.

The solidification of a roadbed is an element of value which is reflected in reduced operating expenses as compared with a newly constructed roadbed of like grade and character.

Solidification is not the result of an actual expenditure of money for that purpose; it is a result of the use of the property and the action of the elements. The increased cost of use of the property is charged to operating expenses and new and undeveloped roads are usually permitted to

charge a higher rate for the service performed to take care of the increased cost of operation. Notwithstanding that fact, a solidified roadbed is more valuable than a newly constructed one.

The difference in value of a solidified roadbed as compared with a newly constructed roadbed is reflected somewhat in the increased cost of operation during a period of usually from three to four years, for a like volume of traffic. On a new roadbed light equipment is usually used for the first three or four years, and in fact in most instances, the business does not justify the operation of heavy equipment even though the roadbed was sufficiently solidified to carry the same. There is some additional cost in the maintenance of the roadbed during this period.

Another item of additional cost is in the maintenance of equipment—that is, the equipment moving the same distance will deteriorate more rapidly on a new road than on an old one, notwithstanding that on the old road the equipment may be loaded more nearly to its maximum capacity and operated at a greater rate of speed. This additional expense is not felt so perceptibly by the new road, because of the interchange of equipment between roads.

During the past twenty years wages have increased from 15 to 40 per cent in cost per hour. Such increased costs are offset by the reduction in the cost per finished unit due to the mechanism of machinery which has been modernized, such as earth excavators, elevators, graders and spreaders, which have reduced the cost per cubic yard of earth in place.

The horse-power pile driver has been replaced with the steam-driven hammer with increased efficiency and a lower cost per unit in place. The use of modern track-laying machines reduces the cost per unit for laying track far below the cost of laying track when hand labor was used entirely. The pneumatic riveters, with unskilled operators, at wages from \$2.50 to \$3 per day, drive ten to one more rivets per day than were formerly driven by hand experts who commanded a higher rate per day. There are some conditions, however, where the cost of labor has appreciated per unit—for example, wages of bricklayers, carpenters and stone masons. While the labor cost per finished unit, such as laying 1000 bricks and a square of shingles, has increased, the appreciation of cost of labor should be governed by the finished unit cost and not the cost per man per hour.

Appreciation of material is due to a greater demand for an available supply. The cost of lumber for railroad purposes, such as ties, bridge piling and bridge lumber, has increased. The present cost of passenger car equipment per seat has increased, which is due to increased space per seat and to the advanced price of lumber and material and general elegance of design. While it is a fact that the cost of locomotives has increased, on account of their increased weight and size, yet the cost per tractive pound hauling capacity has decreased. For example: in 1870 a 4-4-0 type cost per tractive pound 61.30 cents, or \$6,400, while in 1902 the same type of engine cost per tractive pound 57.35 cents, or \$11,185, and in 1913 the cost per pound of tractive power was 44.5 cents.

So far as freight car equipment is concerned, the present cost per car is more than ten or twenty years ago, but the cost per ton of capacity, both steel and wooden cars, is less to-day than formerly. For an illustration: in 1886 a 40,000-lb.-capacity box car cost \$566.50, or \$28.335 per ton, while in 1906 an 80,000-lb.-capacity box car cost \$961.07, or \$21.326 per ton, and steel cars purchased in 1910 of 80,000-lb. capacity cost \$21.70 per ton capacity.

PAPER BY PROF. EDWARD W. BEMIS

Prof. Edward W. Bemis, of Chicago, presented a paper on "The Accounting Side of Rate-Making," an abstract of which follows:

Broadly speaking, nearly all of our courts and commissions and other rate-making bodies confine their attention

to two considerations: (1) the cost of reproducing the property new to-day, less depreciation, and (2) the history of the property in question. These two points of view, which may be called the engineering and the accounting methods, may have more or less relative weight in the final decision, but they are in essence very different, and, as commonly presented in rate cases, lead to vastly different results. The engineering, or replacement, or reproduction point of view generally reaches a much higher basis of rate-making than does the historical or accounting method. The former deals with estimates, the latter with vouchers.

The public has hardly begun to realize the magnitude of the issue. The corporations, quick to see their opportunity, are marshaling all the engineering and legal talent they can command to get our courts and commissions to give precedence to the reproduction theory, as interpreted by interested parties. Cities, states and other public bodies have not realized the importance of the historical method. It must be recognized at once, however, or far-reaching and dangerous precedents are likely to be speedily established that will seriously handicap all future efforts for any fair basis of rates.

It may be that on further consideration the courts will continue to concede to the companies a large addition over cost in the case of land, and may insist on present prices of labor and material, but the public will still keep for itself a considerable part of the various unearned increments now claimed by our public utilities, if it can eliminate most of the hypothetical and vast overhead charges usually attendant upon the reproductive theory. To do this, and to meet the rapidly rising claims for going value, resort must be had to a thorough study of the accounts and history of every property under investigation.

The accounting method offers two lines of information: (1) the actual cost of the property now in use, or, where the records are not complete, the cost of the one-half or two-thirds of the property most recently constructed, with sufficient data to form a comparatively close estimate of the cost of the older construction; (2) data by which one may determine what the cost would have been had existing prices of labor and material prevailed, but with the methods of construction such as had been in operation from the start.

In the last analysis, questions of fair rates must be decided as a matter of public policy by those especially trained for that work. A fair return on a just basis will be sought. The actual, efficient sacrifice of the investor, as revealed in accounting and other historical studies, supplemented by engineering advice as to the adaptability and present condition of properties for the purpose intended, will count far more than the estimates of engineers as to what it will cost to buy again land that will never be bought again, to duplicate property that will never have to be duplicated, and to build up a business that will never again have to be developed.

Both our industrial structure and our life in cities would be inconceivable without the existence of the various public utilities whose rights are being investigated. But the cost of recreating this structure cannot be capitalized to the benefit of our public service corporations. They bore but little of the cost of that development, and what they did bear, and the profits obtained and divided in the process, will be fully revealed by the historical method. Considerations of justice in courts and regulating bodies seeking to conserve fairness and public policy may then be trusted to work out a fair result to all concerned.

PAPER BY DR. A. F. WEBER

A paper on "Depreciation and Its Relation to Fair Value" was read by Dr. A. F. Weber, chief statistician New York Public Service Commission, First District. An abstract follows:

It cannot be denied that the physical property other than

land that goes to make a productive plant is a wasting asset that sooner or later is consumed in operation. The line between the "circulating capital" and "fixed capital" of the economist must necessarily be an arbitrary one. Coal, oil, water and other materials of manufacture have an exceedingly short period of useful life and are, of course, charged to expense and not to capital account. The bell rope in a car has a somewhat longer life, but when renewed is nevertheless treated by accountants as a supply rather than a repair item. If an automobile had a similarly short life, its cost would also be charged against the revenue of the period during which it was put into service, but since our generally accepted period of accounting is the year and an automobile will render service more than one year, its cost must be distributed over more than a single year. It is idle to say that no depreciation accrues until the automobile is discarded and thrown on the scrap heap or sold for what it may be worth to some less exacting *entrepreneur*. At that time the accrued depreciation becomes realized depreciation.

In estimating the economic life of a wasting asset, it will be manifestly improper to consider only physical depreciation and ignore functional depreciation. The former is, of course, capable of more accurate determination than the latter, but experience must in either case be the real guide. In this comparatively young country there are, for example, many buildings of brick and stone that are more than a century old and are still in very good condition, but this fact does not deter the engineer from limiting to fifty or possibly seventy-five years the estimated useful life of a building that he is appraising. Experience has taught him that the building will in all probability be torn down on account of the march of improvements within that period; and he recognizes obsolescence as an element of depreciation despite any disclaimer he may make.

While an estimate of the prospective life of particular classes of apparatus like engines, boilers, etc., must be based upon life tables or experience relating to units that have been displaced by reason of functional as well as physical depreciation, it is not practicable to include in that experience apparatus thrown out of use in consequence of the stoppage or destruction of an entire industry. The loss of assets in the form of turnpikes, stage coaches, road inns, etc., which followed the introduction of railroads in England and the older parts of this country was one of the risks of the business. Risks are taken into consideration in determining the rate of return rather than the amount allowed as the fair value, and in the valuation of a public utility the deduction for depreciation will not include allowance for the possible obsolescence of the entire industry.

In view of the disputed meaning of the word depreciation, it might be well to substitute for it whenever accuracy of statement is desired in discussions of productive plant the alternative term "expired capital outlay," which exactly describes the nature of depreciation in the case of wasting assets.

Although depreciation in its relation to value has but recently become the subject of general discussion in connection with public utility regulation, it long ago received judicial construction in connection with other questions laid before the courts for determination. The assessment of property for purposes of taxation necessarily involved the question of depreciation, which was always allowed to the property owner as a deduction from value. In the adjustment of fire losses, also, depreciation had to be considered, for no insurance company could be compelled to reimburse a policy holder for the accrued depreciation on a structure destroyed by fire. In condemnation proceedings, again, depreciation was invariably deducted, although the final determination of value was based on some factors that do not enter into a rate case. The most important of these factors, of course, is earning power, which is itself derived from and based upon the rates under consideration.

Since 1909 the public utilities have contested the rule laid down in the Knoxville case, and while they have secured some degree of recognition on the part of a few commissions, they have made little impression on the state courts and no impression on the highest national court. Only last June the Supreme Court in its unanimous decision in the Minnesota rate cases reversed the lower court and held that an appraisal was manifestly incomplete that included structures at reproduction cost new when in fact they had depreciated owing to ordinary wear and tear or other causes.

When the advocate of the sinking-fund method of depreciation asserts that the productive plant which has been well maintained and is working at 100 per cent efficiency is as valuable in its twentieth year as a new plant of the same original cost, he is obviously ignoring the fact that the older plant cannot be made to yield the same net profits as a new plant.

It must be assumed that in the usual case present value represents a judgment reached by the appraiser after inspection of the condition of the property, assisted it may be with life tables of standard machines and apparatus. There are many problems still to be solved in connection with overhead expenses attending the installation of fixed capital, and there are grave difficulties in the way of handling depreciation and fixing rates during the development period of newly established public utilities. But with respect to enterprises that have entered the stage of reasonable profits, it is clear that the annual allowance to be made for depreciation as an item of operating expense should be whatever amount the company regularly puts into its depreciation fund, provided that amount be found, after careful investigation, not to be excessive. No more than this charge should be allowed because it is unfair to tax consumers in order to swell dividends. Consumers will not be satisfied with the answer that the company is obliged to return depreciation moneys to the property when needed, because they have too often been obliged to put up with inferior service on the plea that funds could not be obtained for necessary improvements. Stock assessments are actual things rather than names only in foreign countries. They are never heard of here except in cases of reorganization when the stockholders receive new securities of an equal or greater par value than the assessment that they pay. The public will willingly pay rates that will enable the company to keep its investment intact, provided such moneys are used to develop the property and the issue of new capital obligations is correspondingly curtailed. The success of this policy may be seen in the low price of gas combined with relatively high dividends in Toronto and in most of the cities of England.

Fortunately, there may now be noted a strong tendency on the part of the courts to enforce that policy here through their refusal to sanction new security issues for replacements that ought properly to be paid out of depreciation reserves accumulated from income.

PAPER OF DR. ROBERT H. WHITTEN

Dr. Robert H. Whitten, librarian-statistician New York Public Service Commission, First District, discussed valuation decisions of the commission with which he is connected. An abstract follows:

In the following discussion the principles of valuation used by the commission in its decisions are considered in so far as they have a bearing upon the determination of fair value. The opinions in these cases were written by Commissioner Milo R. Maltbie.

In determining fair value for rate purposes, the decisions of the commission do not disclose that any one rule or factor has been selected as a single standard. The underlying thought is that, valuation being a step in the determination of just compensation, the whole problem is to determine that amount which, used as a base, will at the rate of return fixed result in just compensation to the company for the

service rendered. In determining the fair value as one step in the process of determining the reasonable cost of production, both actual cost and reproduction cost are considered important.

The commission has recognized the close interdependence of fair value, fair rate of return, and current expense and income accounting. It is actual total return that is of prime importance to both parties. This actual return is the product of all these factors. The real actual return cannot be known unless all these factors are known. The actual return is altered whenever one of these factors is altered. The interdependence of fair value and fair rate of return is the basis of the commission's ruling as to "going value." The interdependence of fair value, income accounting and fair rate of return is the basis of the commission's treatment of the appreciation in land value. It is the total actual return that is of importance. Justice, equity and public policy demand that the company be permitted a total actual return that will be adequate, but no more than adequate, to compensate it for the service rendered. In the past attention has often been centered on valuation to the exclusion of the end for which the valuation is made, which is the determination of the total actual return for the service rendered. Fair value cannot be determined without reference to rate of return and income and expense accounting as it is the interplay of all these factors that produces the total actual return.

Actual cost.—The general practice of the commission has been to have its bureau of statistics and accounts make a thorough examination of the accounts and records of the company, with a view to determining as far as practicable the actual investment or sacrifice on the part of the company. The financial history and capitalization of the company are studied, and operating expenses for a series of years are analyzed. In none of the decisions thus far rendered have the construction accounts been in such shape as to admit of an accurate determination of the actual cost of any large proportion of the property. Consequently, much more weight has necessarily been attached to estimates of reproduction cost than would be the case if actual cost had been known. In many cases, however, records of recent construction have been secured that have been of material assistance in checking the estimate under the reproduction method for unit prices and overhead expenses. Through an examination of books and accounts the commission, while not able to determine actual cost, has in most cases been able to fix on a maximum investment. It has been able to say that the actual cost could not have exceeded this maximum amount. Even this has been of great value as it has enabled the commission to refuse with equity certain purely hypothetical claims for allowance under the reproduction method.

Reproduction cost.—As the investment records proved inadequate the commission has in each case been compelled to rely largely on an estimate of reproduction cost. This estimate has been made with great care by the commission's engineers. In certain cases the inventory has been prepared by the commission's engineers with the co-operation of the engineer for the company, and the appraisal has then been checked by the engineer for the company. In other cases the company's witnesses have made independent appraisals. The unit prices have been fixed after an examination of the company's records and a comparison with prices of well-known manufacturers and contractors for a period of about five years.

Contractors' profit, engineering and administration, contingencies and incidentals.—The net cost of labor and materials having been determined by the commission, an allowance is added to cover general contractors' profit, engineering, supervision, contingencies and incidentals where these allowances seem justifiable. It has been a general practice for the commission to allow 10 per cent for general contractor's profit and from 10 per cent to 15 per cent

for engineering, supervision, contingencies and incidentals upon the items to which these charges would properly apply. Even where a general contractor is assumed, his profit is not allowed upon land, rolling stock, tools, supplies, fixtures, etc., as such items are not purchased through a general contractor. The allowance for general contractor's profit is in addition to the allowance for sub-contractor's profit, which is taken care of in the unit prices upon which the net cost is based. The percentages allowed vary somewhat with the particular items. Thus, in valuing a street railway property but 5 per cent was added to the cost of rolling stock to cover all these items. In some cases the general allowance has been 15 per cent while in others it has been but 10 per cent or 12 per cent. In the latter cases there has been a very thorough checking and rechecking of the inventory, with the result that omissions have been largely obviated; where the inventory is complete, the allowance for incidentals and contingencies is relatively small. The commission illustrates this by stating that in its experience in planning subways it is unable to foresee just what conditions will be met and just what conditions will be necessary. An additional station or connecting track may be found desirable as the work progresses; these would not appear in the original plans, but in an appraisal of the system when completed they would all appear and would be appraised. The commission is gradually collecting accurate data on the question of proper percentage allowances through the examination of accounts, the approval of securities, and the supervision of rapid transit construction contracts. The indications are that the allowances heretofore made have been quite liberal. The commission is disinclined to allow for expenditures under these heads for work of which there is no record and which is based largely on hypothetical conditions of reproduction. The commission feels that the particular kind and amount of allowances included should in general follow the methods by which the particular plant in question has been developed. This appears to be of particular importance in the case of allowance for piecemeal construction and contractor's profit. It is evident that the entire appraisal must be treated as a unit. Otherwise duplications or omissions are sure to occur. In the Kings County lighting case the commission's allowance for the above items amounted to 15.4 per cent on the net cost of physical property, including land.

Preliminary and development expenses.—The commission includes allowances to cover promotion expense; organization of the company; franchise and consent expenses; interest and taxes during construction; trial operation; adjustment of parts, etc. These are mostly items such as are ordinarily classified as overhead charges. Certain of the items, such as trial operation and adjustment of parts, are sometimes considered in estimating going value. For many of the items included under the general head of "preliminary and development expense" there are few data upon which an estimate of cost may be based. The commission gives great weight to any evidence showing actual expenditures incurred by the company for these purposes. It is inclined to give slight consideration to estimates of reproduction cost for these items based on hypothetical conditions. The allowance made by the commission is not given as a percentage of net cost, but is a lump sum which under the conditions applicable to the particular company seem to the commission adequate to cover all of these expenses. This allowance as a percentage upon the reproduction cost of physical property, including land, would naturally vary considerably for different companies. Many expenses are nearly the same in amount regardless of the size of the company. Discount on bonds is not considered by the commission a proper part either of actual cost or of reproduction cost. The question of a usual or normal discount would doubtless have some bearing in determining the rate of return to be allowed a company, but has no direct bearing upon money cost. It has been the practice of the commission to compute

interest upon the entire cost for one-half of the equated period of construction.

Accrued depreciation.—From the cost of reproduction new the commission deducts the accrued depreciation. The estimate of accrued depreciation is based chiefly on life tables and the application of the straight-line method. The estimate covers depreciation due to wear and tear and age and to some extent to changes in the art and the abandonment or supersession of property because of inadequacy. The commission's ruling that accrued depreciation must be deducted in determining fair value for rate purposes has subsequently been sustained by the Appellate Division of the State Supreme Court, and by the recent decision of the United States Supreme Court in the Minnesota railroad rate cases.

Land.—In its valuations the commission has taken the position, following what it believes to have been the decisions of the courts, "that land should be taken at its present fair value, provided the plant is wisely located and well planned." The commission points out, however, that inasmuch as the buildings upon the land are appraised upon a use-value basis, instead of a scrap-value basis, there would be duplication and inconsistency in appraising the land at the highest price it might bring, assuming the land to be unoccupied. The commission has refused to allow the fair value of the land to be increased by an estimate of the assumed cost of buildings upon the land at the time of purchase. The commission's refusal to apply the strict reproduction theory to land value is clearly upheld in the recent decision of the United States Supreme Court in the Minnesota railroad rate cases. The Supreme Court goes further, however, and disallows all overhead charges, including interest during construction, that have been included as a percentage on land value.

Appreciation in land value.—Although the commission takes land at its present or appreciated value it has adopted a method of treating appreciation as income, and thus neutralizing to a certain extent the effect of appreciating land values in the determination of a reasonable rate of charge. If the problem is to determine the fair cost of production, it is clear that income or profit from every source must be considered. Some persons in considering the matter very frankly admit that appreciation in land value does constitute a very important part of the real income of certain public service companies. But they argue that inasmuch as this source of additional income was probably counted on by those who originally invested money in the enterprise it is not fair to deny them the advantage of such appreciation in a rate case. In this they overlook the true nature of a "fair average return." A "fair average return" is assumed to be not a part payment but a payment in full. It should necessarily take into consideration all the conditions and be full compensation for the service rendered. If, however, the view is taken that income from land appreciation should be treated as a separate and additional item and should not be included in the fair return, then the fair return must necessarily be reduced by the amount of such appreciation. The result is, of course, the same. If appreciation is disregarded in the income account, it must nevertheless be considered in fixing the rate of return. There is no escape from the logic of the position that in determining a fair average return profits from every source must in some way be considered. If they are not included in the income account, they must necessarily be considered in fixing the fair rate of return. There can be neither logic nor equity in the position that a total fair average return can be determined without a due allowance for profits from appreciation in land value.

Pavement over mains and services.—The commission has declined to include in fair value the estimated cost of replacing pavement over mains and services where such pavement has actually been laid without expense to the company.

Property donated.—In the Brooklyn Union Elevated rate case the proposition to include in value property constructed out of the city's contribution to the expense of grade separation was rejected.

Going value.—The commission points out that certain expenses often included in an estimate of going value have been included by the commission in its allowances for overhead percentages and preliminary and development expense. In so far as going value is used to cover provision for pioneer losses or failure to earn profits during a development period of normal length the commission holds that it should be taken into account in fixing the fair rate of return. In doing so the commission properly distinguishes between valuation for rate purposes and valuation for purchase purposes. In a rate case the justice of the result does not depend upon the fair value alone or on the rate of return alone, but on the total return or net income allowed, which is the product of the fair value and the rate of return. In a rate case, therefore, certain equities may be provided for either in the fair value or in the rate of return. If they have been considered in the rate of return it would be duplication to allow for them again in the fair value, and vice versa. These two factors are interdependent and must be considered together. It is interesting to note that in the Minnesota Railroad rate cases the Supreme Court of the United States, while it did not discuss the general topic of going value, did in considering adaptation and solidification as an offset for depreciation refer to the fact that "knowledge derived from experience" and "readiness to serve" were mentioned as additional offsets and holds that "the realization of the benefits of property must always depend in large degree on the ability and sagacity of those who employ it, but the appraisal is of an instrument of public service, as property, not of the skill of the users." The commission points out that throughout its appraisals all units are treated as parts of a going concern, and not as parts of a system that is to be dismantled and sold as second-hand property. Some court decisions and even certain decisions of the United States Supreme Court seem to mean that the going concern factor receives sufficient consideration if to a plant in successful operation is given a valuation based on costless-depreciation of the complete plant, and not on the mere salvage value of its separate units.

Municipal lighting contract.—In the Kings County lighting case the company claimed that there should be included in the valuation a capitalization of profits from an exceedingly profitable street-lighting contract which, at the time of the valuation, still had five years to run. The commission rejected this claim.

Working capital.—A discriminating discussion of working capital as applied to a gas company is contained in Commissioner Maltbie's opinion in the Kings County case.

Annual depreciation allowance.—In estimating the annual depreciation allowance in a rate case the commission has not followed literally either the straight-line method or the sinking fund method. In the first place, it has attempted to ascertain the extent to which minor replacements are included in the repair account and treated as current operating expense. It has then estimated the amount which in addition will be required to take care of all replacements due either to wear and tear and age or to obsolescence and inadequacy. In the case of long-lived units it has taken into consideration the interest accumulations from the annual depreciation allowances. To this extent it has applied the sinking fund method. The commission holds that the allowance must be for current depreciation only, and that in cases where a company has not set aside in past years a sufficient amount to cover the accruing depreciation such fact cannot be taken into consideration in fixing the annual allowance for depreciation in a rate case.

Rate of return.—The commission holds that fair value

and rate of return are interdependent factors. The commission holds that the rate of return should be adequate to induce investors to construct utility plants within the particular areas in question. The commission calls attention to the interdependence of rate of return, fair value and income accounting. If, for example, average annual appreciation in land value is not included in income, and thus constitutes an additional profit to that indicated by the rate of return, this fact would necessarily have an important bearing upon the fixing of the rate of return. In so far as the rate of return fixed does not include all elements of profit, it may be less than a rate of return where all elements of profit are included. Moreover, if the commission were to allow a fair value for uncompensated losses incurred in the establishment of the enterprise, instead of including such allowance, as is its custom, in the rate of return, such rate of return could of course be smaller.

RAILWAY ELECTRICAL ENGINEERS AT CHICAGO

About 200 delegates, representing the electrical departments of the principal railroads of the United States and the allied manufacturing and supply interests, attended the opening sessions of the Association of Railway Electrical Engineers' convention, held at the LaSalle Hotel, Chicago, Oct. 21 to 24.

A number of papers were presented and discussed. These covered among other things the subjects of head-end train-lighting systems, terminal facilities for handling car-lighting equipments, electric headlights, methods of battery charging, building and yard lighting, and self-propelled cars.

W. A. Del Mar, of the New York Central & Hudson River Railroad, chairman of the committee on wire specifications, presented the report of that committee, which covers wires and cables for pressures up to 15,000 volts. Paragraphs on the chemical analysis of rubber, potential test requirements, explanation of terminology used and order forms for wires and cables were included in the report. R. H. Rice, Chicago, told of the work of the American Electric Railway Association in compiling similar specifications.

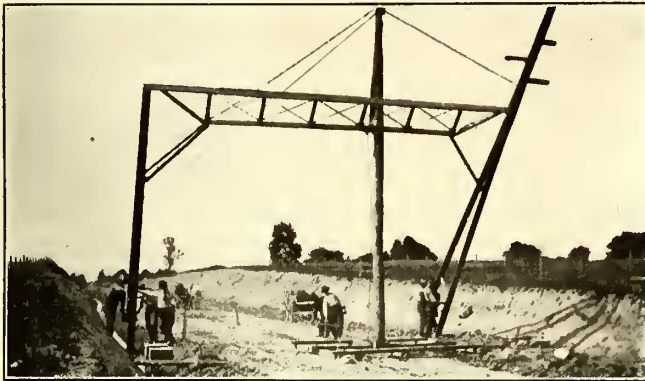
C. R. Gilman, of the Chicago, Milwaukee & St. Paul Railroad, chairman of the committee on data and information and the question box, read a report which revealed a tendency among railroads to replace arc lamps with large tungsten units. For the twenty-two roads reporting, the total rating in alternating-current shop motors exceeded that of direct-current motors by 8877 hp. The increasing use of alternating-current motors was ascribed to their lower first cost, greater reliability, lower maintenance expense and greater flexibility.

The relative merits of various reflecting and diffusing media with different spacings of units were discussed in the report of the committee on illumination, of which Mr. Lewis S. Billau was chairman. The experiments from which the committee derived its conclusions were conducted in passenger coaches furnished by the Lake Shore & Michigan Southern Railway. Center-deck and side-deck systems were investigated with a view to obtaining adequate illumination, pleasing effects, good efficiency and satisfactory distribution of light. Center-deck lighting was found to compare favorably with side-deck illumination. For direct lighting, units should not be spaced more than 6 ft. apart. The color of head-linings had no appreciable effect on the useful illumination produced by direct units. The illumination values obtained showed the desirability of using lamps of higher lumen output.

Arthur J. Sweet, Milwaukee, said that head-linings should have a light color in order to reduce the contrast with the lamps. Fifteen-watt lamps had been found inadequate for proper illumination, and 600-lumen lamps were better.

NEW CATENARY CONSTRUCTION ON CUT-OFF OF NORTHERN OHIO & TRACTION LIGHT COMPANY

The Northern Ohio Traction & Light Company has recently opened for service a portion of the proposed double-track interurban line between Akron and Cleveland. This cut-off leaves the old line at Chittenden and is built on a



Steel Catenary Bridge Being Erected in One Piece

private right-of-way for a distance of 7½ miles until it rejoins the old line at Fells. This leaves only 5 miles of single-track line between Cleveland and Akron.

The rails are 80-lb. A. S. C. E. on wooden ties. Cinders were used for ballast throughout. The maximum curve is 1 deg., and the maximum grade is one-half of 1 per cent. All waterways are cared for by concrete culverts except that ingot iron pipes are used where the drainage areas are small. Way stations, 8 ft. x 10 ft., were built at each highway crossing. These stations are mounted on a concrete platform 15 ft. x 18 ft. The walls are of cement plaster on Trussit metal lath, and the roofs are covered with Spanish tile.

The catenary trolley system was adopted for this cut-off and will replace the poles on the rest of the line as fast as they require replacing. The overhead structure is supported on steel bridges placed 300 ft. apart. Two 500,000-



View Showing Steel Catenary Bridges and Substation on Cut-Off of Northern Ohio Traction & Light Company

circ. mil copper feeder cables were used as messengers, and the trolley wires are suspended from these by twelve hangers in each span. In addition, the bridges carry a three-phase, 22,000-volt transmission line with ground wire which feeds substations at Northfield and Bedford.

The bridges are shown in the accompanying engravings. They consist of two bents of A shape, with a cross-truss.

The two vertical members of each bent are 7-in., 9¾-lb. channels. The truss has an 8-in., 11¼-lb. channel for the top chord and a 6-in. channel for the bottom chord. The vertical members of the trusses are angle struts of a special design, and the diagonal members are ⅝-in. rods. The whole construction is stiffened by knee braces. An extension to carry the high-tension line, consisting of two 5-in., 6¼-lb. channels, braced together, is bolted to one of the bents. The complete bridge is supported on four concrete piers, each leg being held by two 1-in. anchor bolts 3 ft. 6 in. long. The bridges were designed and furnished by the Archbold-Brady Company, Syracuse, N. Y., but were erected by a local contractor. As shown by the erection view they are sufficiently stiff to be raised in one piece.

SAN FRANCISCO ASSOCIATION DID NOT WANT MR. DALRYMPLE

Considerable interest was excited in San Francisco during the recent visit there of James Dalrymple, manager Glasgow Corporation Tramways, because of a series of resolutions which the Public Ownership Association of that city adopted last August. The president of this association is C. W. Eastin, and its purpose is to promote the public ownership of public utilities in the city of San Francisco, as provided by the charter of the city. Word was brought to this association early last summer that Mr. Dalrymple expected to visit this country, and at the following meeting of the association, held Aug. 6 in the Pacific Building, San Francisco, the resolutions printed below were adopted. Under instructions of the association a copy of these resolutions was forwarded to the Lord Provost and City Council of Glasgow by the secretary of the association. Evidently, however, they were not effective in preventing the visit of Mr. Dalrymple.

"Whereas, in response to the request of the then Mayor of Chicago, Edward F. Dunne (now Governor of the State of Illinois), the city of Glasgow in 1906 sent, instead of John Young, James Dalrymple, its tramway manager, to Chicago, to advise Mayor Dunne as to the construction and operation of municipal street railways in that city; and

"Whereas James Dalrymple during a large part of his sojourn in this country hobnobbed with representatives of the corporations that control the street railways of the American cities and in his report to Mayor Dunne violated the confidence of his host (who was paying out of his personal funds all the expenses of Mr. Dalrymple!) and, instead of confining his advice to the purposes for which he was invited, devoted a large part of it to a political attack upon the people of the cities of America; and

"Whereas more than a score of large cities throughout the United States are now considering the taking over of their street railways for municipal operation; and

"Whereas the Glasgow City Council has just granted permission to Mr. Dalrymple to visit the street railways of America, therefore, be it

"Resolved, that the Public Ownership Association of San Francisco regards the proposed visit of Mr. Dalrymple to the United States as a political move on the part of the corrupt corporations that own and operate the street railways of American cities, which intend to use him to injure the widespread movement in favor of public ownership of street railways in this country; and be it further

"Resolved, that the Public Ownership Association of San Francisco respectfully urges the Lord Provost and City Council of the city of Glasgow to withdraw their permission to James Dalrymple to visit the street railways of the United States, in order that he may not insult the American people again by his presence in this country, desiring, as we do, to promote the continuance of the harmony and good-will which has always prevailed between the people of America and progressive Glasgow."

COMMUNICATION

ENGINEERS ON COMMISSIONS

NEBRASKA STATE RAILWAY COMMISSION, ENGINEERING
DEPARTMENT
LINCOLN, NEB., Oct. 18, 1913.

To the Editors:

There has appeared recently in the public press notice to the effect that Hon. Charles A. Prouty, now a member of the Interstate Commerce Commission, is to retire at an early date to become director-general in an appointive position in charge of the national valuation work now begun. If this report is correct, a vacancy on the commission board will occur. It is certain that one of the greatest problems ever placed before any body is now before this commission in the finding of the value of our railroad, telegraph and telephone properties. It further must be a fact that this is and will be the great question before this body. There is no member of the commission at present professionally equipped to treat with the matters at first hand, which, in other words, is saying that no present member can be said to be an engineer economist of experience in solving such problems.

It is true that engineers and economists have been and will be employed extensively to carry out the great task, but this can hardly be made an argument against the suggestion of the appointment of a new man who shall be an engineer competent and experienced in appraisal and economic matters. There are excellent reasons for offering this suggestion, and it is trusted that it will be looked upon with favor by those empowered to name the new member. It is trusted, also, if this suggestion meets with favor, that engineers generally will become active in its behalf. Our boards of health are composed of doctors and specialists, while similar conditions are prevalent everywhere. In this situation why cannot a member of the commission itself be an engineer fully qualified to deal with matters at first hand?

E. C. HURD, Engineer.

THE MANGANESE OPEN-PRICE ASSOCIATIONS

An account was published on page 767 of the issue of this paper for Oct. 15 (Convention Daily edition) of a meeting, Oct. 14, at Atlantic City, of the standardization committee of the Manganese Steel Founders' Society and the Manganese Trunk Society. As this committee and the two societies themselves have recently been organized largely as the result of the suggestions of Arthur J. Eddy, of Eddy, Wetten & Degler, Chicago, Mr. Eddy was requested to describe more in detail the "open-price" arrangement under which the various companies operate. In reply Mr. Eddy said:

"There was one line in the article in the *ELECTRIC RAILWAY JOURNAL* of Oct. 15, referring to the meeting of manganese open-price societies, which requires correction, and that is the statement at the opening of the article that the open-price associations are formed on the basis of a 'new theory of price agreement.' No agreement of any kind or character regarding prices is permitted in an open-price society. On the contrary, the very theory of the open price is diametrically opposed to any agreement or understanding, direct or indirect, regarding prices. It is my personal conviction that such agreements and understandings are not only illegal but are of no practical value and not worth the breath it takes to utter them. The history of 'gentlemen's agreements' in the past has been one of violation of confidence imposed and resulting conditions more vicious and disastrous than existed before the agreements were entered into. I have no faith in the practical efficacy, to say nothing of the legality, of any sort of pool, combination or associa-

tion that has ever been tried the object of which was to fix prices or control competition.

"I have a great deal of faith in the open price and in the operation of open-price associations, which were very well described in the remainder of the article printed in your issue of Oct. 15. Personally, I believe in prices so openly and publicly quoted by manufacturers and contractors that if I had my way each industry would have headquarters as public as a stock exchange, with a blackboard in public view whereon would be displayed every price, every bid and every offer, very much as are the transactions on the blackboards of stock exchanges and boards of trade. All bidding should be as open as on government work. The secret price is a thing of the past. The open price is the price of the future and is coming as certainly as the sun will rise to-morrow morning."

Mr. Eddy was asked whether the open price would apply to buyers as well as to sellers.

"Precisely the same. For instance, there is no reason in the world why the purchasing agents of railroads, steam and electric, should not have their associations wherein they would interchange the prices they pay for all purchases. The government and every city makes known the prices they pay for all materials and labor. Why should not the large corporations of the country be equally frank and public in the transactions of their business? Is there any conceivable reason why the purchasing agent of a great steam railroad or of an electric railway should not make known to the stockholders and the public generally where every dollar that he expends goes and the price he pays for every article he purchases? When you come to consider it, is there not every reason in favor of his so doing? Would not such a policy immediately destroy all opportunity for graft, and would not the effect of such a policy be to stabilize all prices at normal levels?"

"For instance, if the purchasing agent of a railway interchanged freely information regarding prices for products, is it not perfectly plain that the manufacturers of those products would be compelled to treat all railroads exactly alike? A manufacturer could not sell at one price to an electric railway in San Francisco and at a lower price to an electric railway in Los Angeles. If he knew that the prices he received would immediately become public property, he would sell to both cities on an equal basis, transportation charges considered. The suggestion that purchasing agents organize their own open-price association is not new. It was made by John C. Jay, of the Pennsylvania Steel Company, in an interesting article in one of the iron trade journals wherein he, as the head of the selling department of a great company whose principal customers are the railroads, urged the purchasing agents of the roads to organize an open-price association and bring cut into the limelight every price they paid for whatever they had to buy. His article aroused such widespread interest that he received not less than thirty-one letters from purchasing agents discussing the suggestion pro and con. Most of them thought the suggestion was too far ahead of the times, but I am sure that we are on the eve of that very thing; that the time is at hand when the public generally, and the stockholders in particular, will insist that detailed statements be made regarding all expenditures of money by corporations.

"The members of the manganese steel societies have already taken action toward the extension of the facilities of their organizations to their customers with a view to enabling their customers to form open-price buying associations. This fact alone illustrates how fundamentally different the open-price associations are from the old-line combinations. The very last thing in the world that an old-line combination desired was any sort of an association on the part of its customers. In a word, this entire open-price proposition is a revolutionary step in the direction of publicity and the suppression of secrecy."

NOTES ON TRACK MAINTENANCE

BY E. W. GOSS, SUPERINTENDENT MONTGOMERY TRANSIT COMPANY

In lining curves where they are full of kinks at the joints the use of the bender or jim crow should not be neglected. It should be applied on the outside of the joints after the spikes are pulled, and the joint should be bent in beyond the true line of the curve so that it will not spring back out of line when the bender is taken off before the rail is spiked down. If the curve was sprung in when it was laid, as many of them have been, the chances are that the only way to make it stay in place will be to pull the spikes and run the bender all the way around the curve, care being taken not to tighten it up too much and thus give too much set in the rail. The inside rail should be made true as well as the outside one.

Too many track men do not appreciate the value of using the rail bender on their curves when first laying the track. The tendency of rail is to straighten itself unless specially bent, and this makes "sprung" curves hard to keep in shape as they are constantly getting out of line. Curves that have "flat joints" are extremely hard on rolling stock. Not only are they uncomfortable to ride over but they give the wheel a sidewise hammer blow which is detrimental to the flanges. In fact, not a few broken axles as well as wheel flanges have been caused by this action.

The above remarks, of course, do not apply to special work or curves that have come from the manufacturer all ready shaped, though care must be used in putting this work together to have it properly line up. In putting in switches where the lead rails have to be curved in the field they should be bent with the bender so they can be laid in place without springing. If the track man will pay attention to this he will, after a few years, have much less trouble with the switches than if everything had been forced into place.

In putting in special work, switches, frogs and curved rails from the shop, it is most undesirable to tighten the joint plates until everything is properly lined and in place, as it is impossible to straighten a kink in the tightened connections without first loosening the bolts and allowing them to assume new positions. No amount of heaving on the lining bars will move them when tight, but when loosened they will take their proper positions with the exercise of but little effort.

As no track will ever keep in place unless the surface water is taken care of, proper drains should be provided wherever necessary, and at some points where it is impossible to get the ditches alongside of the track low enough a "blind drain" through the center of the track may be put in and the water taken away underneath, leaving the surface in shape to drive over. At places where more water passes than can be taken care of with the ordinary drain pipe and not enough to require a bridge, it is better not to have the rails run across from abutment to abutment on stringers of iron or wood. Instead, a concrete slab reinforced with old rail or I-beams may be advantageously installed. This can be covered with ballast and this permits the track to be brought to surface without being tied to the height of the stringers or having a bad dip at their ends.

The subject of greasing curves looks like a minor detail and probably receives about as little attention as any one of the little things about track maintenance. On most roads this matter is attended to by the operating force and the track foreman has no say as to how or when it shall be done. A boy is usually sent out after being told to put the grease on the inside of the "high rail," or else he receives no instructions at all. He naturally greases at this point, with the idea that it will stop the wheels from climbing over the rail, which to a certain extent is correct.

Yet if a heavily loaded car is run around a curve with the inside rail sanded the outer wheels are likely to climb the high rail, even if the high rail is greased. If they do not actually go over, they will rub very hard. The inside wheel must slide across the top of the inside rail, otherwise it must keep going straight ahead. A practice that the writer has made use of for years is to grease the top of the inside rail and thus allow the wheel on that rail not only to slip in its rotation, but to slide endways on that rail, taking much of the thrust off the high rail. Motormen who have run for years over track where the inside of the outer rail has been greased will generally regard with suspicion the custom of greasing the top of the inside rail of a curve. However, they soon find that the car goes around the curve more easily than before.

PRIZES FOR BALL TEAMS

An unusual scene was enacted in the offices of the Public Service Railway at Newark, N. J., last week, when President Thomas N. McCarter greeted a large group of employees, mostly trainmen, and handed out twenty-one gold watches and an even dozen watch fobs. It was an evidence of the lengths to which this company has gone in its welfare work among its men, for the recipients of the gifts were the winners and runners up of the Public Service baseball league. There were so many teams from the different carhouses that two leagues were formed, one in northern Jersey and the other in the southern end of the State. The North Jersey league was again divided into two sections for convenience and to minimize loss of time in traveling for home and home games. At the close of the regular schedule the Camden team had won the championship of the southern league and the Hoboken and Hilton teams were the winners in their respective divisions in the northern end of the State. These two played off, and Hoboken won.

As an incentive to the men and an evidence that the company management was encouraging their sports, announcement was made at the opening of the season that President McCarter would give watches to the individual members of the northern champion team and that Second Vice-president John J. Burleigh would do likewise for the southern champions. The fobs were added as consolation prizes for the Hilton players, and as an added surprise a watch was given to W. H. Shepherd, the league manager, by General Superintendent Newton W. Bolen.

The presentation of the prizes was made quite a ceremony. The three teams were brought to headquarters and met by Mr. McCarter and other executive officials. In giving the tokens, the president also gave a brief talk commending the men and touching on the company's interest in their welfare. The ball players had luncheon in the home office dining room and then went to Hilton, where Camden and Hoboken tried to settle the question of supremacy, but darkness intervened before five innings had been played. Both sides were satisfied, and Mr. Bolen took the three teams to dinner at the company's expense. Several other officials attended the dinner.

WELDING ON LIGHTING CURRENT

It is well known that the voltage required for arc welding is so low in comparison with the standard railway voltage from which it is obtained that about 80 per cent of the original input is wasted in resistances. On the face of things, this practice is most inefficient and one which should be abolished if possible. Where much welding is done it is a question of simple arithmetic as to whether it would pay to install a motor-generator set. The small user, however, still remains at a disadvantage. It has been suggested, therefore, that since most welding is done during the daylight hours, it might be profitable to purchase from

the local lighting company direct current at 110 volts or 220 volts. One criticism of this plan is that owing to the fluctuations on an arc-welding circuit, the lighting company might object to the business because of the effect upon the lights of its other customers on the same line. This could be determined only by actual experience in each case, but it is probable that in most cases the effect on the voltage would be no greater than that caused when power motors are thrown on and off the circuit.

METALLIZED GRAPHITE FOR BEARINGS AND COLLECTOR BRUSHES

A new metallized-graphite product suitable for self-lubricating bushings, for collector brushes on dynamo-electric machinery, for packing rings in steam turbines and for many other uses where a self-lubricating metal is desired is being put on the market by the Graphite Metallizing Corporation, Yonkers, N. Y. The basic element of "graphalloy," as it is called, is pure graphite, and to this constituent by a process of impregnation is added a molten metal to give the completed product solidity that it may be machined to the desired form and have the requisite strength and durability. The process of impregnation of the graphite with the metal is accomplished by the use of air pressure of high values, such as have hitherto been considered commercially impracticable.

Graphalloy has a high compressive strength and can be accurately machined, threaded or tapped with no more difficulties than are met with in working brass. For machining a speed about 25 per cent in excess of that used for brass is to be recommended. Some of the most important mechanical properties are given below:

Weight of solid graphite electrodes per cubic inch.....	0.057 lb.
Weight of graphalloy impregnated with babbitt.....	0.145 lb.
Increase in weight due to impregnation.....	150 per cent
Specific gravity of graphalloy.....	0.4 per cent
Percentage of metal in graphalloy by weight.....	60 per cent
Percentage of metal in graphalloy by volume.....	25 per cent
Compressive strength of graphalloy per square inch.....	14,000 lb.
Modulus of rupture.....	12,500 lb.

The lubricating qualities of this product are said to be practically those of graphite and the manufacturers claim that on light-duty machines operating at high speeds excellent results can be obtained. For use on circuit-breakers and other electrical contactors graphalloy is made from pure graphite and copper or brass as the service demands. Experiments have shown that for controller and circuit-breaker contacts which are being continually subjected to the action of an electric arc the best combination is graphite impregnated with brass, the theory being that the zinc in the brass vaporizes under the action of the arc and tends

Pressure, Lb., per Sq. In.	Current, Amp.	Current Density, Amp. per Sq. In.	Contact Drop, Volts
1.0	12	48	0.090
1.0	25	100	0.177
1.75	12	48	0.053
1.75	25	100	0.066
2.5	12	48	0.045
2.5	25	100	0.052

to disrupt it. It has been found that with this combination of materials less trouble is experienced from pitting. In cases where the lowest possible specific resistance is needed pure copper is used instead of brass. Graphalloy contacts are said to be entirely free from "freezing troubles."

Tests made by the New York Testing Laboratories show that graphalloy slip-ring brushes have a specific resistance of 20.77 microhms per cubic inch. When these figures are compared with the specific resistance of a cubic inch of carbon, which is 1240 microhms, and of graphite, which has a specific resistance of 320 microhms per cubic inch, it will be seen that the combination product presents a large advantage in conductivity.

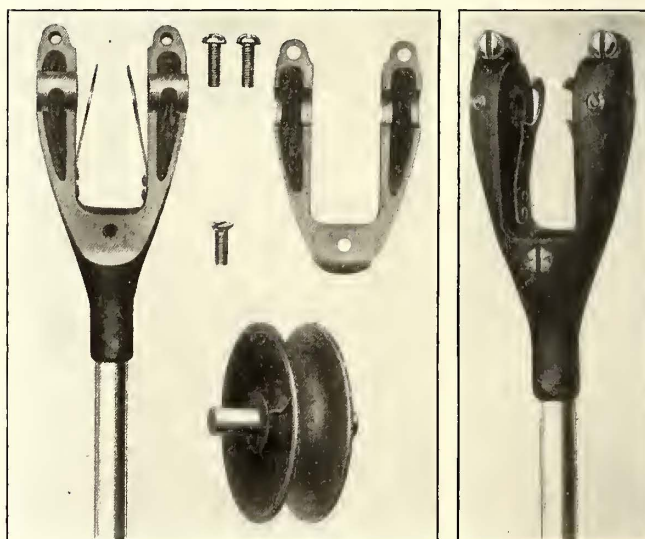
A table is also published of the various contact drops in voltage at a speed of 2500 ft. per minute and at various pressures used in commercial brush holders.

From this table it will be noted that the average contact drop is 0.07 volt. The current-carrying capacity of graphalloy has been found to be approximately 200 amp per square inch, although the maximum allowable current density varies largely with the class of service and also with the limiting temperature of the brush.

A NEW TROLLEY HARP

A new trolley harp, embodying some distinctly novel features in design, has been added to the Western Electric Company's already extensive line of electric railway supplies. The new design, known commercially as the "M-B" trolley harp, is a radical departure from the former standard type, which made use of a graphite bushing.

The harp proper is made in two parts with two steel wheel bearings set in recesses and held in place by steel dowel pins. Both halves of the harp are provided with



New Design of Trolley Harp and Parts

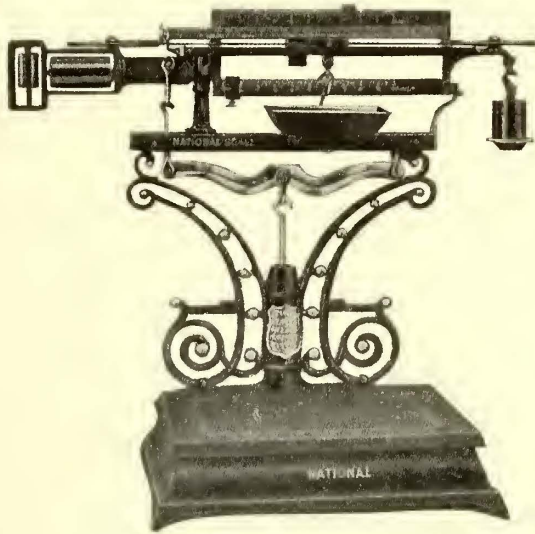
chambers for holding a lubricating device which consists of a wool yarn packing or oil wick which is saturated with heavy motor oil. To insure thorough lubrication, a slot is cut in the steel bearings so that the wheel spindle may come in contact with the wick. The oil chambers have sufficient capacity to hold a week's supply of lubricant. To replenish the oil supply, it is only necessary to press the point of the oil can against the spring checks on the top of the harp.

The trolley wheel is equipped with a bronze axle, which is sweated into the hub, and the combination of the bronze spindle or axle and the steel bearings is calculated to lengthen the life of the wheel to a considerable extent. Another excellent feature of the design is found in the fact that the tension of the trolley base keeps the wheel spindle resting on the bottom of the steel bearings. This has been found to aid greatly in reducing vibration and in increasing the conductivity. Furthermore, current is not conducted through the spindle or bearings, but is collected by strong bronze contact springs.

Several hundred actual service tests were made before the new trolley harp was finally declared ready for the market. These covered a period of over three years, and they have given the equivalent of over 10,000 miles of service for the harp when used in conjunction with a standard 4-in. wheel. The new design, with its various features which insure long service life, is particularly adapted to high-speed work, and is therefore desirable for both urban and interurban use.

WEIGHING AND COUNTING MACHINE

Several electric railway companies, including those in Detroit and Philadelphia, are using a machine for counting transfers and tickets by weighing them. This machine is made by the National Scale Company, Chicopee Falls, Mass. This machine is so delicate that it can be used for



Weighing and Counting Machine

counting items weighing from 1/25,000 oz. to 15 lb. each, in capacities ranging from 8 oz. to 6 tons. This permits a very wide variety of applications. The machine illustrated is type No. 97, which counts pieces weighing 1/4 oz. or more up to a weighing capacity of 100 lb.

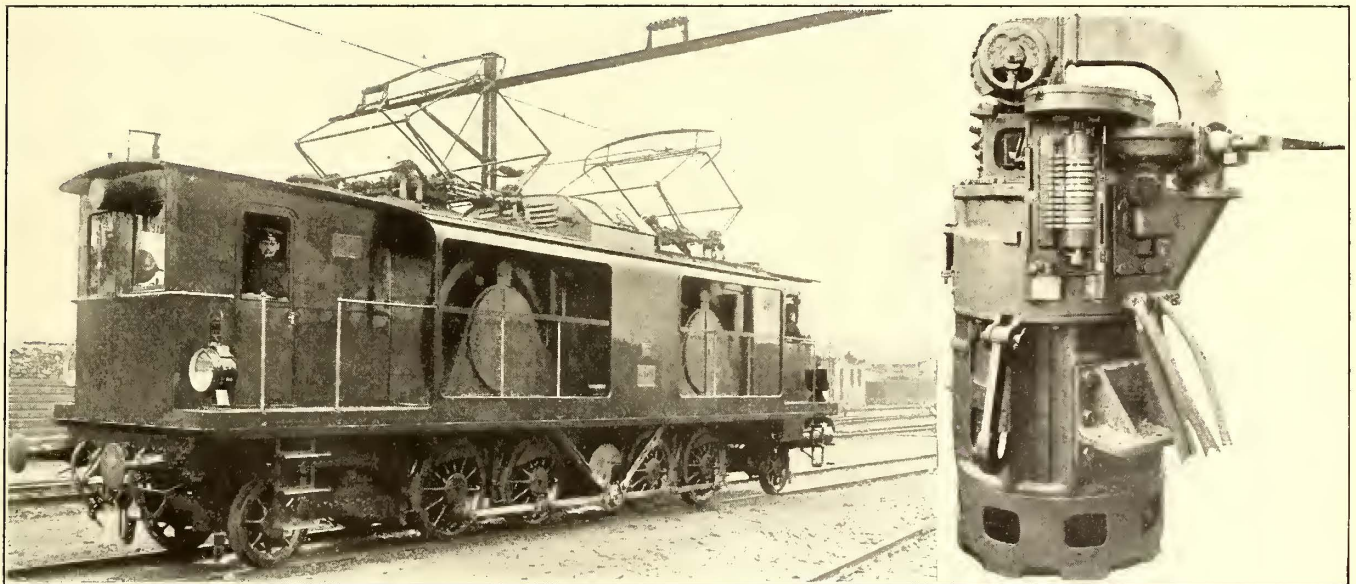
To obtain the number of tickets, transfers, etc., the tare of the package is first set out on one of the weighing beams. Then enough pieces to represent the average condition of

the number of pieces on the weighing platform. It is asserted that the count will be practically correct and more nearly absolute than any other method of counting. If the individual pieces themselves are subject to variation in weight, such a condition is overcome by increasing the number of pieces in the ratio pan. Weight may be obtained in addition to count as upon any other weighing machine. The capacity of any machine is limited only by its weighing capacity. By doubling or multiplying the number of pieces placed in the ratio pan, the capacity of the counting bar is doubled or multiplied in the required degree.

It is believed that machines of this character should save much time and labor in the auditor's office and the storeroom. In the former they can be used as already noted and even for checking standard coin-counting machines. If the transfers or tickets given up by passengers are segregated according to routes, the machines can be used to obtain traffic counts at lowest cost. In storerooms they are desirable to save time in counting accurately the number of bolts, nuts, screws and other small parts, because the ordinary storeroom scale is not accurate or fast enough for such work.

NEW DESSAU-BITTERFELD LOCOMOTIVE

The latest locomotive furnished by the Siemens-Schuckert Company for the Dessau-Bitterfeld single-phase electrification of the Prussian-Hessian State Railways is the combination freight and passenger type shown in one of the accompanying illustrations. This locomotive is designated as type 1-D-1, which means that it has one leading axle, four driving axles and one trailing axle. The driving axles are operated from two floor-mounted motors by means of crank rods, which are connected through the crank pins of a single jack-shaft. Each pair of driving wheels is on a separate truck. This locomotive is capable of drawing a train of 1200 metric tons at 21 m.p.h., or



Semi-Inclosed Locomotive of the Dessau-Bitterfeld Line and Potential Regulator for Same

the stock are placed in the ratio pan on the counting bar. The pieces placed in this pan are not weighed, nor is it necessary to know their weight. The count obtained on the bar does not include the pieces in the ratio pan. After the articles to be counted have been placed on the weighing platform, the ratio pan is moved along the bar until the beam is in balance. The indicator above the pan, as set for a desired maximum, will then show upon the counting bar

one of 700 tons at 34.7 m.p.h. For passenger service this locomotive can be operated at a speed of 55.8 m.p.h. The tractive effort at the circumference of the driving wheels is 39,600 lb. momentarily at starting and 18,040 lb. for one hour.

The superstructure of this locomotive is one of its most striking features, since only the end cabs for the engineer are fully inclosed, enough of the sides being left open to

expose the motors and the sides of the transformer to the open air. The motors, however, are protected by means of sheet-iron covers, which may be raised for inspection whenever desired. In addition to the cooling effect of the open-side construction, special provision for the commutator is made by means of a ventilator. It will be noted also that a louver is built in the roof directly over the water-cooled transformer.

The high-tension oil switch is operated with compressed air. The control apparatus includes a main switch for each motor and two reversers. These switches are operated from a low-voltage control circuit. Speed control is attained through the potential regulator illustrated. An unusual feature of the locomotive outfit is an electrically heated boiler for use when passenger trains are hauled.

TRIPLET STORAGE BATTERY CARS IN GERMANY

In the chapter on self-propelled cars published in the Oct. 4 issue of the *ELECTRIC RAILWAY JOURNAL* an elevation was presented of the triplet car outfits which have recently been constructed for the storage battery car service of the

3.4 cents instead of 3.04 cents; also that no equipments have been furnished for a greater operating radius than 111.2 miles. The equipment figures have also advanced about 5 per cent, as compared with the prices given in the former article.

SERVICE OF 31.5-TON FREIGHT LOCOMOTIVE

The Omaha, Lincoln & Beatrice Railway received in March, 1912, a 26½-ton Baldwin-Westinghouse electric locomotive equipped with four Westinghouse 101-K, 35-hp, 500-volt, non-commutating-pole railway motors and HL unit switch control. Shortly after this locomotive was placed in service it was ballasted up to 31½ tons, by means of long castings bolted to the underframe into the pocket provided for this purpose. The locomotive has pneumatic sanders, engine bell ringer and Westinghouse A.M.M. brakes with emergency features.

The locomotive is equipped with four rail-carrying hooks, two on each side, with a capacity of three rails each. This arrangement allows for the carrying of a small amount of rails and ties for light repair work, while heavy repair



One of the New Triplet Storage Battery Cars, Prussian State Railway

Prussian-Hessian State Railways. The accompanying illustration shows one of these cars ready for use. The general arrangement of the end cars is like that of the standard twin articulated design which has been developed for these railways, but the middle car has been added primarily to give larger baggage and postal compartments or a greater variety of passenger classes. If the three cars are used exclusively for passengers, the passenger capacity is 167,

material can be carried on the work train hauled by the locomotive. In the winter when freight business is light the locomotive is fitted with a snow plow. At other times the locomotive may be used for switching, coal, lumber, emigrant cars, freight, express and baggage service and also for construction work. Up to the present time no repairs have been needed during over one year of service.

In view of the fact that the locomotive was ready to



Electric Locomotive of Omaha, Lincoln & Beatrice Railway Hauling Freight Cars

but if baggage and postal compartments are provided, the passenger capacity is reduced to 118. As in the other cars, the batteries, which are mounted in cabs at the ends, were furnished by the Accumulatoren-Fabrik Aktiengesellschaft. The battery manufacturer states that the contract price for the maintenance of its standard batteries, as noted in the *ELECTRIC RAILWAY JOURNAL* for Oct. 4, should have been

handle freight, the management of the road induced manufacturers to locate their plants at different points on the system. While the present freight service is not sufficient to keep the locomotive constantly at work, traffic is steadily increasing. On the 8-mile line between Lincoln, University Place and Bethany, this locomotive handles 2000 to 2500 loaded cars in and out a year.

LONDON LETTER

(From Our Regular Correspondent)

With regard to the offer made recently by George Balfour to purchase the tramways and electric light and gas undertakings of the Stirling Town Council, the tramways committee of the Council has recommended that Mr. Robertson, manager of the Greenock Corporation Electricity Works, be asked to report in regard to the electric light undertaking; that Peter Fisher, manager of the Dundee Tramways, furnish a report on the tramways, and that the Stirling Burgh Surveyor report to the Council as to the circumstances.

Three new lines are contemplated at Preston to link up portions of the existing system. A line will be constructed from Moor Park Avenue, on the Garstang Road, to Brook Street, near the Cattle Market, and join the present line at Ashton-on-Ribble. The second extension will connect the Fulwood line with Fylde Street. The existing dead ends in Corporation Street will be linked up, making a through line to the railway station. Another new line will be laid along London Road to Walton Bridge, a distance of 1 mile.

Large profits are reported at Wolverhampton, where the Lorain surface contact system of tramways is installed. The profits for the twelve months ended March 31 are £24,232, to which is added £306 profit on a motor char-à-bancs service. The traffic receipts for the year constitute a record in the history of the undertaking.

The special committee appointed recently by the Bristol Corporation to consider whether the corporation should take over the Bristol Tramway retained J. B. Hamilton and J. F. C. Snell to advise on the matter. As the result of the report of these two gentlemen, the committee recommends the Corporation to apply to Parliament for powers to work the company's undertaking if it should decide subsequently to acquire it.

A sub-committee representing the County Councils of Renfrew, Lanark and Dumbarton has been appointed to confer with representatives of the Corporation of Glasgow in order, if possible, to make an arrangement applicable to all the areas concerned regarding the conditions under which the Glasgow tramways should be extended outside the city boundaries. The question arose recently in connection with a proposal of the Corporation to extend its lines from Cathcart to Clarkston in the south and from Anniesland to Blaurarthill in the west. The county councils wish to stipulate that all widenings of roads or formation of new roads in connection with corporation tramway extensions should be carried out entirely at the expense of the corporation, but to the satisfaction of the district committees of the different county councils and according to their specifications. Hitherto the tramways have been bound to maintain only the roadways between their tramway rails and 18 in. on either side. The county councils think that the responsibility of the Corporation for maintenance should extend further.

A new petrol car has been completed for the Stirling & Bridge of Allan Tramway and has been tried on the Glasgow Corporation lines. The car, made by the Lanarkshire Motor Company, Glasgow, holds twenty passengers inside and twenty-four in open-air seats on the outside. The chassis is of the single trolley type, with axles 6 ft. apart, and the motor is of 25 hp with four cylinders. For keeping the engine cool there is a large radiator on the top of the car, connected by pipes to the water jackets of the cylinders. The flywheel and leather clutch are of the ordinary type, and the drive is through a three-speed gear box to double bevels lying centrally between the axles. A double sprocket is fitted, so that the drive is taken by both axles. The car, which is to run between Bridge of Allan and St. Ninians, through Stirling, will be the first of the kind in Scotland.

At a recent meeting of the Glasgow Town Council a motion was carried advising the Corporation to appoint a special committee to consider and report as to the feasibility of establishing a system of tube electric railways from the extreme east to the extreme west, and from the extreme north to the extreme south, as a means of solving the question of congestion on the streets. In seconding the motion

it was suggested that parallel routes as a tramway reform would not relieve congestion very much, and the three remedies open to the Corporation to relieve congestion on the busy streets were aerial railway, underground tube and motor buses. This committee will consider the whole question.

The tramways committee of Newport Corporation has resolved to report to the Council in favor of promoting a bill in Parliament which would secure to the Corporation the exclusive power to provide services of railless trolley cars within the borough of Newport and certain adjoining areas. The committee is encouraged to report in favor of applying for powers to increase the services as the experiment with increased fares on the existing system of tramcars resulted in a substantial increase in revenue and in the number of passengers. Important sections of the town and suburbs are not reached by the present system, and, with the new powers, the docks and other places not hitherto served will be accessible. Conferences will also be held with local authorities in the lower part of the Western Valleys with a view to running the new cars in outlying districts.

The electricity committee of the Manchester Corporation has determined to erect a new station at Trafford Park with an output of 100,000 kw, though the first instalment of the plant will probably amount to only 25,000 kw. The new site is a considerable distance from the center of the city, but the economies which will be effected will be such as more than to balance any disadvantages. The delivery of coal by boat to the works will effect saving of as much as a shilling a ton, and if the necessary arrangements can be made with the Ship Canal Company condensing water will doubtless be available from the canal, obviating the necessity for the erection of cooling towers. The final effect of all the possible economies will be that whereas the cost of the plant at the existing stations works out at £20 per kw that at Trafford Park will probably be little more than half that amount.

The London County Council has under consideration the question of installing on the tramways of the Bermondsey Borough Council a service of cars worked by means of a petrol-electric generator. The Council is of the opinion, however, that it is desirable to test the working of the cars on a route which has already been electrified, and has accordingly applied to the Board of Trade, under the provisions of the London County Tramways (electrical power) act of 1900, for sanction to run cars of the type described as an experiment on the tramways between Tooley Street and Greenwich Church.

The highway committee of the London County Council for some time past, in order to popularize the tramways, has had copies of the tramways map and guide distributed in the Council's schools, and now has under consideration the question of further advertising the tramways. It has been decided to arrange a map, in twelve sections, indicating evening institutes and polytechnics, and to take various other steps to bring the tramways under the notice of those attending the Council's educational institutions. In the meantime the highways committee reports that for the eleven weeks ended Oct. 2 there has been an increase in gross revenue of about £14,000.

The general manager of the London, Brighton & South Coast Railway has announced that the extension of the electrification of suburban lines is to be rushed and that probably within a year all the stations on the line between Balham, Thornton Heath and West Croydon will have a fast electric service with London Bridge and Victoria. It is also intended to extend the electrification as far as Sutton and Cheam, on the Portsmouth line, and then to electrify between London, East Croydon, Purley and Stoa's Nest, the whole work being completed in from four to five years. There are at present 900 trains which run in and out of London Bridge Station each day, which is 50 per cent more than before the electrification of the South London and Tulse Hill lines, and 700 trains are now run from Victoria compared with 400 before electrification. The general manager states that under electric operation the company can run a train in and out of the station in one minute, whereas with steam it takes six or seven minutes.

A. C. S.

News of Electric Railways

Progress with Unification Ordinance in Chicago

The sub-committee of the local transportation committee of the City Council of Chicago, which is considering the terms for the unification ordinance for the Chicago Railways and the Chicago City Railway, the members of the board of supervising engineers and the officers of the companies met on Oct. 18 and after a long session it was announced that only three points in the proposed merger ordinance remained unsettled after adjournment. Agreement had up to that time been reached on the following points:

"Surface lines of Chicago shall enter into a physical merger, providing for the unified operation of all railways.

"Through routing of all cars so far as local conditions permit—eliminating switchbacks and downtown switching.

"Purchase of enough additional cars to utilize completely the added track facilities, giving through routing and increasing downtown transportation facilities 30 per cent.

"More rapid transit by through service cars.

"Five-cent fare throughout the whole city.

"Accounting basis to be the same as under the old ordinance.

"Provision for investment in first mortgage bonds.

"Authority for the company to lease such property as it now owns but does not have immediate use for.

"Agreement of the city to guarantee payment of shortage in the receipts of the Calumet company, growing out of its failure to make 5 per cent.

"Heat within the cars to be 50 deg. Fahr. when it is 10 or more deg. above zero outside and 45 deg. when only 5 deg. above zero."

The three points which remained unsettled by the committee on Oct. 18 were the electrolysis provision, the price to be paid by the companies for street cleaning and the use of T rails in the outlying parts of the city instead of the standard type of grooved rail. These points have all been settled since then and the corporation counsel's office will draft a unification ordinance which will be presented to the Council on Nov. 10 for passage. It is expected that the ordinance will be passed in the form that it was submitted by the local transportation committee. It will be necessary to pass the ordinance as quickly as possible, owing to the fact that the Illinois State Public Utility Commission has been created, effective on Jan. 1, 1914. Following the passage of the ordinance by the City Council it will be necessary to give thirty days' notice to the holders of the securities of surface railways before submitting the matter to them for approval.

The proposed plan of merger submitted by the surface railways originally on Oct. 4, and published in the *ELECTRIC RAILWAY JOURNAL* of Oct. 11, page 698, formed the basis of the merger ordinance.

Section 2 of this ordinance, which provides for an operating agreement between the companies to carry out the provisions of unified service, has been fulfilled by the companies, and the form of agreement has been made a part of the ordinance. This agreement provides for a board of operation, consisting of seven members, four of whom shall at all times be chosen and be members of the board of directors of the Chicago Railways, and three of whom shall at all times be members of the board of the Chicago City Railway. This board is to be designated during the period of agreement as "Chicago Surface Lines Board of Operation." The first board of operation is to be appointed when the unification ordinance goes into effect and it will hold office from the date of its appointment until Feb. 1, 1917. The successors to this board will be appointed at the end of this period and every three years thereafter. The term of office of the members of the last board of operation will extend from Feb. 1, 1923, to Feb. 1, 1927, when the 1907 ordinances expire.

Other provisions of the operating agreement stipulate that the board of operation shall appoint from its members a chairman whose power shall be similar to a chairman of a board of directors of a corporation. To provide an umpire to settle claims of discrimination by the board of

operation against any company, it is required that one be selected by the companies (acting by or under the authority of their respective boards of directors) within ten days after the unification ordinance goes into effect. The umpire's term of office will be the same as that of the board of operation, the first umpire's term expiring on Feb. 1, 1917. The terms of office of the succeeding umpires are the same as those of the board of operation, namely, three years.

Another provision of the operating agreement is that the board of operation is to appoint from its members an executive committee consisting of three members, one of whom will be designated as chairman. The purpose of this executive committee is to provide for authoritative action during the intervals between the meetings of the board of operation. It will possess and exercise all the powers of the board of operation in the management and direction of the affairs of the surface lines.

The agreement further provides for an executive officer who is to hold office during the existence of the board of operation appointing him. This officer will have charge of the management and operation of all the properties of the companies under the agreement. His authority will be similar to that of a president or general manager in actual charge of operation, and he will have authority to employ, suspend and discharge employees engaged in the operation and management of the Chicago surface lines. His jurisdiction, however, will not include those officers appointed by the board of operation, or the heads of departments who may also be officers appointed by the board of operation.

Another section of the agreement states that City Council is to have the same control over the board of operation, executive committee and executive officers as the City Council now has, with reference to the officers now managing and operating the several companies. It also is understood that this agreement contains nothing which in any way will affect the control over the operations of the street railway lines in the city now conferred upon the City Council and the board of supervising engineers by the traction ordinances.

The concluding paragraphs of the operating agreement include the disposition of receipts provided for in the 1907 traction ordinances, which stipulate that after all expenses of operation have been deducted 45 per cent of the net earnings shall be retained by the surface railways and 55 per cent be paid to the city of Chicago. The operating agreement also provides for a division of the gross receipts between the several companies entering into the agreement.

An inventory of all materials and supplies of each company will be taken as soon as possible after the execution of the agreement. The board of operation will take possession of such material and supplies and make proper credit to each of the companies to the amount of its interest in such material and supplies. In conclusion the operating agreement provides that as soon as possible after the unification ordinance becomes effective, and not later than Feb. 1, 1914, unified operation of all the surface lines under the ordinance will be affected.

Under Section 5 of the unification ordinance, the railways are authorized to lease from time to time any real estate belonging to them and not used for transportation purposes, for such period and upon such terms as shall be approved by the board of supervising engineers and the city comptroller. The net income derived from such source is to be considered and accounted for by the companies as a part of their gross income under the present traction ordinances.

Section 6 of the ordinance provides for the re-use of rail having a wearing life of not less than five years. Under the old settlement ordinance it was necessary to scrap all rail regardless of its remaining wearing life. Under this provision such rails as may be repaired and relaid as directed by the board of supervising engineers will be allowed to remain in the street during their remaining wearing life.

At the time the proposed plan of merger was introduced L. A. Busby, president of the Chicago City Railway, raised the point that the city should clean the streets and bill the

companies for cleaning their right-of-way. As a result of a conference between the commissioner of public works and the engineers of the railway companies, it was agreed that a sum of \$51.50 per month should be charged for cleaning each mile of double track operated during a five-year period. Heretofore the city has been doing the work, but disputes arose as to the amounts of the bills rendered by the city to the companies, a contingency which this new contract removes.

Terms, provisions and conditions with reference to electrolysis prevention were included in the unification ordinance. The discussions and final terms of agreement on this subject are recounted elsewhere in this issue.

In Section 9 of the unification ordinance the city of Chicago agrees to pay to the Calumet & South Chicago Railway, out of its 55 per cent of the net receipts of the South Side surface lines, a sum equal to the aggregate annual deficit of this company as defined in the settlement ordinance, including interest adjustment at the rate of 5 per cent per annum. The board of supervising engineers has computed this aggregate amount of deficit accruing up to July 31, 1913, and found that it was \$303,545. By the acceptance of this provision of the ordinance the Calumet & South Chicago Railway relinquishes all claims and rights under its existing ordinance to charge or collect the second additional 5-cent fare in the territory south of Seventy-ninth Street, as now permitted by its ordinance.

One clause of the ordinance provides that in all construction or reconstruction of sewers and water mains in the streets now occupied by railway tracks, when the width of the street and the location of the underground structures permit, they are to be placed in the street so as not to cause removal of the street railway track. This question has been raised a number of times under the old settlement ordinance and disputes always arose over the proper accounts to which work of this character should be charged. The railway companies contended that it should be a capital charge while the city insisted that it should be taken from operation.

Another provision of the ordinance includes authority to use high T-rails of a design satisfactory to the board of supervising engineers for future track construction in paved streets. This authority is made revocable, however, as it provides that in case the Mayor and City Council do not approve of track constructed in this manner, they may require the company to replace it with the standard 129-lb. girder-grooved rail.

The ordinance also provides that the companies may lay temporary tracks on unpaved streets, or streets where the sewer and water supply pipes have not been constructed, of such types as may be approved by the board of supervising engineers. Under the old ordinances the companies were required to build both permanent and temporary tracks of standard rails and ties, the variation being allowed only in the foundation.

In compliance with the request of the companies the clause covering the heating of cars has been modified as follows:

1. A minimum temperature of 50 deg. Fahr. above zero shall be maintained in all cars in service carrying passengers when the outside temperature is 10 deg. Fahr. above zero or higher.
2. A minimum temperature of 45 deg. Fahr. above zero shall be maintained in all cars in service carrying passengers when the outside temperature is below 10 deg., but not below 5 deg. Fahr. above zero.
3. When the outside temperature is below 5 deg. Fahr. above zero, the temperature in all cars in service carrying passengers shall be maintained at 45 deg. Fahr. above zero, or as near this point as the continuous operation of all heaters in the cars to their full capacity will permit.

Tennessee Power Company Opens Another Plant

The second hydroelectric plant of the Tennessee Power Company on the Ocoee River, in the Appalachian Mountains of southeastern Tennessee, near Parksville, was placed in operation on Oct. 23. This plant, together with the other, 7 miles away, on the same river, will ultimately produce a total of 68,000 hp. The power is transmitted to Knoxville,

Chattanooga and Nashville, Tenn., and to Rome, Ga. The length of the transmission line to Nashville is 150 miles.

The total cost of these two power developments on the Ocoee, which are practically two units of the same plant, was about \$5,000,000. Both were constructed by the J. G. White Engineering Corporation. The one which is just completed took fifteen months to build. In the former the chief feature of the work is a gigantic dam of concrete. In the latter it is an open flume nearly 5 miles long, by which the flow of water is carried along the mountainside. At the end of its journey it passes through steel penstocks, dropping 250 ft. to the turbines. These are of the pressure type, and each has a capacity of 10,000 hp. The transmission line is built for 120,000 volts, but is operated at present at 66,000 volts. The generators are connected to transformers which step the current up to that voltage.

In addition to the 47,000 hp which the Tennessee Power Company generates at its two developments it has the use of 40,000 hp in steam stations belonging to companies with which it holds contracts. The company is already supplying, over transmission lines of 420 miles, all the current used by the Chattanooga Railway & Light Company, Knoxville Railway & Light Company, Nashville Railway & Light Company, Rome Railway & Light Company and Cleveland Electric Light Company, together with numerous other concerns, constituting almost the entire electrical market of eastern and central Tennessee. The population served by those companies is estimated at 330,000.

Complaint Filed Regarding Service in Rochester

A 3-cent car fare with full transfer privileges in rush hours, the re-routing of several lines in the central part of the city and the abandonment of a down-town carhouse for housing purposes, except for cars it is necessary to keep in the center of the city, are demands made by Mayor Hiram H. Edgerton of Rochester, N. Y., in a complaint filed with the Public Service Commission of the Second District of New York against the New York State Railways, Rochester Lines. The complaint is based upon a recent investigation following action taken by the City Council on July 22, 1913. The hearings will start on Nov. 24.

It is charged in the complaint that the income of the street railway system in the city and suburbs exceeds \$1,200,000, after paying operating expenses and the necessary reserve, and that a sum exceeding \$1,200,000 was set aside for the payment of dividends on the capital stock of the New York State Railways. The gist of the complaint is that all the money set aside to pay these dividends was derived from the Rochester lines and that no revenue was derived from the Sodus line or the Rochester & Eastern line. It is claimed that the money set aside was sufficient to pay dividends of not less than 15.5 per cent on the capital stock of the New York State Railways.

Following is the text of the demand for a reduction in fares:

"That the New York State Railways charges the sum of 5 cents for one continuous ride within the limits of Rochester; that such rates are unjust and unreasonable, and the city of Rochester asks that the New York State Railways be permitted to charge only the sum of 3 cents, with full transfer privileges, for one continuous ride within the limits of the city of Rochester between the hours of 5 a. m. and 8.45 a. m. and 4.30 p. m. and 6.30 p. m. on all days except Sundays; that such proposed rates are sufficient to yield reasonable compensation for the service rendered by said New York State Railways and to yield a reasonable return upon the capital actually invested in the street railway system in the city of Rochester and its suburbs."

The second complaint relates to the routing of two lines, which is declared to be "unjust, unreasonable and inadequate." The request is that the cars run down Main Street east to the Four Corners, except during the rush hours between 5 and 6.30 o'clock in the evening. The complaint against the maintenance of a storage carhouse in State Street is based on the congestion and inconvenience to the public, interfering with the use of the street by pedestrians and drivers of vehicles as well as impeding the operation of street cars that run in State Street.

The special railroad committee of the City Council in-

vestigated electric railway conditions and made an extensive report which was served upon officials of the company some time ago. At that time the recommendation was made and the company was asked to reduce the fares to 3 cents during the rush hours. The New York State Railways failed to make the reduction asked for, but it proceeded to put new cars in operation on all lines and to reconstruct many of the cross-town lines. The company also laid much new track in accordance with the recommendation of the Council. After the company had filed an answer to the recommendations of the Council committee and had stated that the reduction of fares during the hours specified was impracticable and that it would not follow out the recommendation, it was decided to ask the Public Service Commission for the reduction.

Chicago Terminal Recommendations Presented

John F. Wallace makes the following recommendations in his report to the terminal committee of the City Council of Chicago:

Establishment of two passenger terminals, one on the West Side and the other at Twelfth Street and the lake front.

Passage of an ordinance allowing plans of the Pennsylvania Railroad, as modified, to be carried out, and permitting Illinois Central to erect a terminal to care for the South Side roads.

Elimination in the course of time of the Dearborn, La Salle and Grand Central terminals.

Adjustment of the routes of surface traction lines to agree with the "two-station" plan.

Widening of Canal Street 100 feet from Twelfth Street to Harrison Street, and, if possible, farther north, by extending it eastwardly over railroad property and supporting it over the tracks.

Reconstruction of Canal Street upon two levels, the upper plane for rapidly moving through traffic and the lower for local hauling. The through cross streets to connect with the upper level and the short cross streets with the lower.

Extension of Monroe Street across the river, making it available as a continuous avenue to the West Side.

Reconstruction and widening of Harrison Street by increasing the width of the roadway to the present building line on each side, arranging for sidewalks by cutting back the first stories of the buildings and forming an arcade.

Approval of the Pennsylvania freight terminal west of Canal Street, providing plan is amended to eliminate objections set forth.

Move north line of main freight building back from Van Buren Street to Harrison Street.

For elevated structure carrying tracks from Twenty-first Street and Stewart Avenue northward to Taylor Street depressed tracks should be substituted north of the river so as to pass under all intervening streets.

Widening of Twelfth Street westward and extending Michigan Avenue to the North Side.

Widening of the principal thoroughfares connecting the central district with the North, South and West Sides of the city.

Establishment of a clearing house for handling less than carload lots of freight outside of the city limits.

At the meeting of the committee at which the report was received Alderman Ellis Geiger, chairman of the committee, read a letter from Alfred L. Baker, president of the City Club, requesting that action on the report be deferred until Bion J. Arnold, retained by the citizens' terminal plan commission, could present his criticism of the finding. The committee notified Mr. Arnold to state what progress he had made, so that it could be determined whether it was advisable to wait.

Opinion of City Solicitor in Regard to Re-routing in Philadelphia

In an opinion submitted to Councils holding adversely as to the Philadelphia Rapid Transit Company's right to re-route its lines without Councils' permission, City Solicitor Ryan summarizes his conclusions as follows:

"First—Under the constitution, no street railway can be constructed in Philadelphia without the consent of Councils.

"Second—The charters of the various street railway companies now controlled by the Philadelphia Rapid Transit Company, as well as the various ordinances granting them permission to occupy streets, designate specifically the streets to be occupied and the routes to be followed by the cars, and these franchises are based upon the reciprocal duty of the company to run its cars for the accommodation of the public over the streets and routes authorized.

"Third—The act of May 15, 1895, does not authorize the Philadelphia Rapid Transit Company to run its cars along other streets or routes than those for which permission has been given by ordinance of Councils.

"Fourth—The contract between the city and the Philadelphia Rapid Transit Company, authorized by ordinance of July 1, 1907, does not relieve the company of the duties imposed upon it by the franchises which it now controls.

"Fifth—The Philadelphia Rapid Transit Company has no right without the consent of Councils to re-route its system so that the cars shall be run over different routes from those authorized by ordinances, and especially has it no right when such re-routing increases the cost of public travel."

The executive committee of the Philadelphia Rapid Transit Company in its reply to City Solicitor Ryan's opinion denying the company's right to re-route its cars without Councils' consent points out, first, that the re-routing was based on a scientific study of the flow of traffic and was designed to give better transportation facilities. Secondly, it was only commenced after full publicity and consultation with various civic bodies. Thirdly, re-routing has been frequently practised before, as in the case of the Darby and Lancaster Avenue lines, which would stop at Thirty-second and Market Streets if the old franchise routes were followed. The company also maintains that its right to re-route does not rest upon expediency or practice but has been expressly granted by the Legislature. The statement quotes from the act of May 15, 1895, which confers on street railways controlling or leasing different lines the right to operate the same "as a general system," and "from time to time lay out new routes or circuits . . . as will in the opinion of the operating company best accommodate public travel." The consent of Councils is not required under this act and the company is made the judge of what constitute the best routes. The Supreme Court of the State, in interpreting this act, has said, "The company is bound to keep pace with the progress of the age in which it continues to exercise its corporate rights."

Newark Terminal Plan Progress Reviewed

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, reviewed the history of the company's plan for the erection of a terminal in Park Place and the re-routing of its lines in Newark at a hearing on Oct. 22 before the Board of Public Utility Commissioners of New Jersey on twenty-seven applications made by the company to the city in connection with its plan. All of the twenty-nine franchises necessary for the carrying out of the project have been granted by the Board of Works, but under the State law the grants by the city body must be approved by the Utility Commission, which has already approved of two. Mr. McCarter likened the proposed terminal to the Hudson terminal in New York. Incidentally, he said that the cost of putting the plan in operation would be nearly \$5,000,000. He told of the congestion, due to the city's peculiar formation, which has made its electric railway service unsatisfactory, and declared that the proposed plan possessed merits which would correct the prevailing evils. Referring to the Morris Canal, he said that it would afford ideal opportunities for a subway running east and west, which would permit the development of an interurban service. The delay of action on the proposed abandonment has been a disappointment to him. The proposition of having subways along Broad and Market Streets was also mentioned by Mr. McCarter, and he declared that the proposed subway which the company would construct across Broad Street at Cedar Street would not interfere with any future subway.

As has been stated previously in the *ELECTRIC RAILWAY JOURNAL*, the company proposes to modify its transfer plan. This matter was referred to at the hearing on

Oct. 22, and Mr. McCarter explained that the company was willing to give a transfer on a transfer, but he declared he would never be a party to an agreement which would permit a passenger to cheat the company by making a round trip for a single fare.

The Boston Arbitration Hearings

The board of arbitration sitting in the Boston Elevated Railway wage and working conditions investigation resumed its sessions on Oct. 29 to enable the company to reply to the case submitted by the employees' organization. Frederic E. Snow, counsel for the company, presented the opening statement of the road's position. He reviewed the points at issue and set forth in detail the present financial condition of the corporation. Important features of the company's case are its existing obligations for the financing of improvements, the effect of the so-called nine-hours-in-eleven law upon its operating costs, and a comparison of its wage scales with those prevailing elsewhere, the last being highly favorable to the company.

The company must provide \$6,350,000 in the near future for improvements to which it is committed. Its stock is selling below par, so that under present conditions no part of this capital can be raised by the sale of additional stock. Only about half the necessary money can be raised by the sale of bonds under the existing statutes. The present outstanding capital stock of the company is \$23,879,400, for which the company has received in cash from its stockholders, \$26,586,828. Practically every dollar paid in is represented by permanent investment. The company has paid 6 per cent dividends to its stockholders. It proposes to show that the working conditions are fair and reasonable, that it pays more than the going rate of wages for similar work under similar conditions and that it can get all the help it needs at the present wages and working conditions.

The payroll of Aug. 1, 1913, had 9474 employees, of whom 4591 were surface conductors and motormen, 443 elevated trainmen, 913 in stations and miscellaneous transportation work, 556 in carhouse service, 1029 in the department of maintenance of way, 161 in the department of wires and conduits, 446 in power and substations, 798 in repair shops and 537 in other departments. The average payment per employee last year was more than \$760. Chairman Howard Elliott, of the New Haven system, stated that the average payment to its 93,000 employees was about \$700 per year. The total Boston Elevated Railway payroll for the fiscal year 1913 was about \$7,250,000, of which \$3,720,000 was paid to motormen, guards, conductors and brakemen. In the daily rush hours there was work for more than twice as many motormen and conductors as at other times. From 40 to 45 per cent of the men were "regulars" and 25 per cent "regular extras." Since Jan. 1 the regular men receive for nine hours' work the pay formerly received for ten hours' service. The regular extra men receive for nine hours' work the pay formerly received for an actual working time of eight hours thirty-six minutes, but the length of time between the first car in the morning and the last car at night has been cut from sixteen hours twenty-nine minutes to fourteen hours fifty-six minutes. The present rate paid by the company to extra men was higher than that paid by other companies similarly situated, and as a rule the others do not have the guaranteed \$12 minimum weekly wage.

An exhaustive study by the company of the wages received by motormen and conductors of at least five years' standing indicates that they averaged \$17.40 per week, or \$907.59 per year, eliminating those not working at least six days per week. In four representative weeks it also appeared that 991 first-year men earned \$12.39 per week; 428 second-year men, \$14.27; 531 third, fourth and fifth-year men, \$15.47; 521 sixth to tenth-year men, inclusive, \$16.80; 346 eleventh to fifteenth-year men, \$17.55, and 564 sixteenth-year men and above, \$17.87. The minimum rate of 25.6 cents per hour paid by the Boston company for first-year men was higher than the rate paid by any other company in New England or in the Middle Atlantic States with the exception of the Empire United Railways, Syracuse, N. Y., which pays 24.5 cents per hour for the first six months and 26.5 cents for the second half-year, and the Hudson Valley Rail-

way, which pays a flat rate of 27 cents per hour regardless of the length of service. The maximum rate of 28.9 cents per hour paid at Boston was higher than that of any other company in New England, and with few exceptions was higher than the maximum paid by any company in the Middle Atlantic States. Up to and including the third year of service the rate of 26.8 cents per hour paid by the Boston Elevated Railway was higher than that of any other company in Massachusetts except the Berkshire, Springfield and Worcester companies, which pay 27 cents to third-year men. The Connecticut Company pays 23.5 cents to third-year men. The rates of the Brooklyn Rapid Transit Company are from 24 to 28 cents per hour compared with the Boston rates of 25.6 and 28.9 cents, and for every year of service the rate per hour at Brooklyn is less than at Boston. It takes the man at Boston longer to reach the maximum pay, but his average is higher in the intervening years. Elevated guards at Boston range from 23.9 to 27.3 cents as compared with 23.5 and 26 cents on the Manhattan Railway, New York. Brakemen on Boston rapid transit lines receive from 21.2 to 24.5 cents compared with 22 and 25 cents in Philadelphia and 20 and 23 cents in Brooklyn and Manhattan.

It is figured that the adoption of the two-class system for shop employees as proposed by the employees' organization would cost the company \$110,728 more per year than the present wages, including a 15 per cent raise in the former. Applications for employment greatly exceed the number of positions available. In the ten months ended June 30, 1913, 3252 men applied for employment as motormen and conductors; 1579 were rejected, 1673 were accepted.

Regarding piece-work, Mr. Snow stated that while the amount done in the company's shops was relatively small, figures for four recent weeks show that shop employees working by the piece earned from 55 to 71 per cent more than if they had worked at the regular rates per hour. It is advantageous to employees and economical to the company. It would be against the interests of economical operation to grant free transportation to employees not in uniform.

Regarding the nine-hours-in-eleven law, the company submitted a discussion showing how its terms cripple the schedule department in laying out work to be handled at a reasonable cost, and contended that if the full effect of this statute is pressed by the men, it will cost the road about \$1,000,000 a year more than at present to operate its service. Owing to the irregularity in the amount of transportation required at different times of the day, no street railway like that at Boston could be properly or economically operated under the limitations of such a law as the one in question. The change from the ten-hour to the present nine-hour day on Jan. 1 last was costing the company from \$150,000 to \$200,000 a year. The permanent investment of the company had increased from \$25,291,913 in 1897 to \$105,684,146 at present, or 317.8 per cent, compared with a gross income increase of 94.6 per cent. The number of free transfer points had increased from fourteen to 103, and the number of free transfer passengers has increased from 23,177,726 to 217,568,572 per year. The ability of the company to maintain its service standards, and in fact its very existence, was largely dependent upon the outcome of these proceedings.

Progress with Rapid Transit Construction Contracts in New York

When the dual system agreements were signed with the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company not one section of the Seventh Avenue line, in Manhattan, was under way. Since then the Public Service Commission has opened bids for one section, has advertised for bids for two additional sections, will soon advertise for two more, and during November will hold hearing on the forms of contract for the last two sections of that line. By the first of the year, therefore, the whole Seventh Avenue subway, from Times Square south to the Battery, should be under contract. Plans for additional sections of the Broadway subway, in Manhattan, and for subway extensions in Brooklyn, the Bronx and Queens have also been completed. In the borough of Queens every construction contract for all the new lines in that

borough has been placed, with the exception of the Steinway Tunnel from its present terminus to the Queensboro Bridge, and that is now being advertised.

In Brooklyn the New York Municipal Railway Corporation (Brooklyn Rapid Transit) has been authorized to contract for the reconstruction of the Sea Beach line, which will connect the Fourth Avenue subway with Coney Island, and work thereon has been started. The same company also has been authorized to contract for the building of the proposed line through Thirty-eighth Street, Brooklyn, to connect the Fourth Avenue subway with the proposed elevated railroads through New Utrecht Avenue and Gravesend Avenue to Coney Island. Work has also begun on this line. It is expected that this road, as well as the reconstruction of the Sea Beach line, will be finished within eighteen months. The commission has about completed the plans for the elevated railroad through New Utrecht Avenue and will soon advertise for bids for its construction. It also has the plans for the Gravesend Avenue, or Culver line, well under way and will advertise for bids for its construction within a short time. Plans are also approaching completion for the two new tunnels under the East River—one for operation by the Interborough Rapid Transit Company and the other by the New York Municipal Railway Corporation. These should be ready to advertise before the end of the year. Plans for the Eastern Parkway subway in Brooklyn and its connections are also well advanced. The first sections of the line, from the end of the existing subway along Flatbush Avenue to Eastern Parkway, will be submitted to bidders within a short time.

In the Bronx three separate lines of feeders for the new subway system will soon be under construction, namely, the Pelham Bay Park branch, the Jerome Avenue branch and the White Plains Road branch. The plans for all these branches are nearly completed, and while it is necessary to hold a few hearings on forms of contracts for new sections, a large portion of the work will be put under contract during November. The total amount of money to be expended by the city of New York in the construction of new lines under the dual system contracts is estimated at \$200,000,000. Of this amount about \$83,000,000 worth of work is already under contract, and it is expected that \$65,000,000 worth additional will be ready to let by the close of the year; so that by Jan. 1, 1914, nine months after the signing of the dual system agreements, three-fourths of the city's part of the work should be under way.

The commission has consented to the assignment of the contract for Section No. 1 of Routes Nos. 19 and 22, the Southern Boulevard and Westchester Avenue branch of the Lexington Avenue subway, from the John F. Stevens Construction Company to the Richard Carvel Company.

New Chart of Organization.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., issued under date of Oct. 1, 1913, a new chart of organization. The chart covers the changes which have been made in the scheme of organization of the company since the property was placed in the hands of trustees.

Canadian Pacific Electrification Plans.—Thomas Shaughnessy, president of the Canadian Pacific Railway, has denied the report from Milwaukee crediting him with stating that the whole Canadian Pacific Railway system might be electrified. It is intended to electrify Rogers' Pass tunnel, and if this proves successful to extend the electrification over the mountain division from Revelstoke to Field, B. C.

Short Strike in Knoxville.—Fifteen employees of the Knoxville Railway & Light Company, Knoxville, Tenn., recently went out on strike because the company did not recognize a union that a visiting agitator endeavored to form. Only eight men joined the body, however, and the strike was settled peaceably in two days. One hundred and sixty-five employees signed a published statement to the effect that they had no grievance against the company.

Duluth Franchise Case.—Federal District Judge Amidon recently dismissed the application of the Central Trust Company, New York, N. Y., for an injunction to restrain the city of Duluth from bringing suit to test the validity of the franchise of 1881 under which the Duluth Street

Railway operates. The case has since been argued, the company closing with the defense that for more than a quarter of a century the State and the city repeatedly recognized the legislative franchise granted to the company in 1881.

Plan to Amend West Virginia Commission Law.—Unless the present Public Service Commission law of West Virginia gives the commission absolute authority to control rates of public service corporations, the Legislature will be convened in extraordinary session at once and the law will be amended, according to a statement issued by Governor Hatfield, apropos of the questioning by representatives of gas and water companies as to the authority of the commission to prevent gas companies in the northern part of the State from increasing their rates.

London & Port Stanley Electrification Approved.—The by-law to raise \$700,000 in debentures to provide funds to electrify the London & Port Stanley Railway was carried on Oct. 22. As a result of the vote the City Council must now appoint a board to take over the control of the steam road to Port Stanley. This will be done immediately, and Adam Beck, chairman of the Hydro-Electric Power Commission of Ontario, is to be offered the chairmanship. Engineer Warfield, who reported favorably on the project, will probably be general manager of the line. He declared that the road will be ready for operation by electricity by next June if preparatory work is started at once.

Meeting of Toronto Council Postponed.—The special meeting of the Toronto City Council called for Oct. 23 to discuss the proposal to purchase the property of the Toronto Railway and Toronto Electric Light Company has been postponed. Mayor Hocken has announced that the meeting will probably be held in the first week of November, after the reports of Auditor John Mackay and Engineer H. H. Couzens have been presented. The former document, which is to deal with the proposed purchase from the standpoint of its financial merits or demerits, is expected about Nov. 1. The report of Mr. Couzens will state the advantages or disadvantages of amalgamating the electric light property with the city's hydroelectric system.

Municipal Ownership Proposals in British Columbia.—A joint committee of members of the City Council of Nelson, B. C., and business men formulated a plan recently for the purchase by the municipality of the street railway system owned by the British Columbia Electric Railway. Following the suggestion made recently by Mayor Baxter of Vancouver that the city purchase the street railway system from the British Columbia Electric Railway, Alderman McMaster moved that the company be asked to state on what basis it would be willing to dispose of the system to the city. On receipt of the statement of terms the Council will probably seek through a plebiscite to obtain power to act.

Extension of Time for Installation of Block Signals.—The Public Service Commission of Indiana has granted the Terre Haute, Indianapolis & Eastern Traction Company, Union Traction Company of Indiana, Fort Wayne & Northern Indiana Traction Company, and the Ohio Electric Railway an extension of time of three months from Oct. 1 to complete the installation of the block signals which were ordered for these lines for the year 1913. The companies petitioned the commission for the extension of time. They showed that they had completed all their work for the installation of these additional signals, but that the signal company had not been able to get all its material on the ground in time and that it was impossible to complete the work by Oct. 1.

Mayor Harrison of Chicago on Subway Matters.—In a speech which he made at the recent annual municipal dinner of the Chicago Association of Commerce Mayor Harrison, in reviewing the problems before the city for settlement, said: "In the matter of subways we are like the Duke of York—we have marched up hill and down again. There are three forms of subways proposed to Chicago. The first is a system in the 'loop' district for surface lines; the second is for elevated roads in the 'loop' district, and the third is a comprehensive system of underground routes. The first of these I believe to be a delusion and a snare, and it will not relieve congestion in the central district. At present

the surface lines do not want the elevated roads to have subways and the elevated roads do not want the surface lines to have subways and neither wants a franchise to be awarded to outside parties."

Plans Outlined for Proposed Subway in St. Louis.—James D. Houseman, president of the St. Louis & Western Traction Company and the St. Louis County Belt, Illinois & Eastern Traction Company, has issued a prospectus explaining his plans for rapid transit facilities for St. Louis and its suburbs at a cost of \$17,000,000. According to the prospectus these plans include a subway for the downtown district, with an elevated extension in the West End, two interurban systems, one in Missouri and the other in Illinois, two new bridges, one across the Missouri and the other across the Mississippi River, and an electric belt line around St. Louis, paralleling the city limits. The prospectus contains a map showing the route of the subway, the St. Louis County Belt Railway line and the location of the two proposed new bridges, for which he has obtained franchises, as well as a copy of the bill for a subway franchise, which was introduced in the House of Delegates on July 15, 1913, as referred to previously in the *ELECTRIC RAILWAY JOURNAL*.

Seattle Accepts Highland Park & Lake Burien Railway.—The City Council of Seattle, Wash., has passed an ordinance accepting as an unencumbered gift the property of the Highland Park & Lake Burien Railway, including the line extending from Iowa Street and Alki Avenue to Lake Burien, a distance of 9 miles, half of the line being within the city limits and the whole of it within King County. Councilman Oliver T. Erickson announces that as soon as the property of the Seattle, Renton & Southern Railway is acquired by the city he will introduce a bill authorizing the issuance of \$100,000 of utility bonds in order to extend the Lake Burien line from Iowa Street and Alki Avenue across the Waterway to a connection with the Seattle, Renton & Southern Railway on Jackson Street, and later will urge the issuance of similar bonds for an extension of the municipal street railway lines into the Green Lake district. A. L. Valentine, superintendent of public utilities, estimates the cost of making the extension from West Seattle to Seattle Boulevard at \$113,000, the cost of a substation at \$10,800 and the rehabilitation of the line at \$6,400.

Arrests in Connection with Disorder During Recent Indiana Strike.—As a sequel to the recent short-lived strike on the Indiana interurban lines, United States Marshal Edward H. Schmidt and his deputies made a trip to Mooresville, Ind., on Oct. 6, and on affidavits sworn to by Post Office Inspector William T. Fletcher arrested twelve men, the specific charge being the violation of the federal law against obstructing the United States mails. Several of the men were trainmen in the employ of the Terre Haute, Indianapolis & Eastern Traction Company who had reported for work upon the company's ultimatum which ended the strike in August. The other men were former employees who had been discharged. On Aug. 25, after the last car had completed its night run, poles and wires were cut near Mooresville, on the Martinsville Division of the Terre Haute, Indianapolis & Eastern Lines, and the poles laid across the track. The first car from Indianapolis on the morning of Aug. 26, carrying the mail for Mooresville, was compelled to return to Indianapolis on account of the poles and high-tension lines being down, which brought about the arrest of the twelve men on Oct. 6. The men were all arraigned for a hearing before United States Commissioner Howard S. Young on Oct. 6. They asked for time to obtain counsel, and the case was continued.

PROGRAM OF ASSOCIATION MEETING

Railway Business Association.

The annual meeting of the Railway Business Association will be held at the Waldorf-Astoria Hotel, New York, at 11 a. m., on Dec. 11. The election of officers will take place at 1:30 p. m. and in the evening the annual banquet will be held. The speakers at this banquet, so far announced, will be Howard Elliott, chairman, New York, New Haven & Hartford Railroad, and Hon. James M. Cox, Governor of Ohio.

Financial and Corporate

Stock and Money Markets

Oct. 29, 1913.

The sales of stock on the New York Stock Exchange to-day totaled only 216,366 shares. While the transactions were light in volume and the market opened weak, trading rallied and toward the close buying became more vigorous and slight upturns were noted all through the general list. The local transaction issues were especially strong. Third Avenue Railway sold at 40, showing a gain of two points for the day. Rates in the money market to-day were: Call, 4@5¼ per cent.; sixty days and ninety days, 4½@4¾ per cent.; four, five and six months, 4½@5 per cent.

Trading on the Philadelphia exchange to-day was very narrow and for the most part in odd lots. There was considerable demand for bonds.

Trading on the Chicago exchange to-day was indifferent. Considerable gains were made, however, in several of the leading issues. The bond market was dull.

The Boston market to-day was dull and irregular. Most of the railroad issues sold off.

The sales of stock on the Baltimore exchange to-day totaled only 373 shares. Bond sales were \$64,200, par value.

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

	Oct. 22	Oct. 29
American Brake Shoe & Foundry (common).....	38½	88½
American Brake Shoe & Foundry (preferred).....	128	128
American Cities Company (common).....	36	36
American Cities Company (preferred).....	63	62¾
American Light & Traction Company (common).....	336	330
American Light & Traction Company (preferred).....	103½	105
American Railways Company.....	38¾	38%
Aurora, Elgin & Chicago Railroad (common).....	40	40
Aurora, Elgin & Chicago Railroad (preferred).....	82	84
Boston Elevated Railway.....	85	85
Boston Suburban Electric Companies (common).....	7	7
Boston Suburban Electric Companies (preferred).....	59	59
Boston & Worcester Electric Companies (common).....	a10	a10
Boston & Worcester Electric Companies (preferred).....	42½	39
Brooklyn Rapid Transit Company.....	87	87¾
Capital Traction Company, Washington.....	115	115
Chicago City Railway.....	160	160
Chicago Elevated Railways (common).....	25	25
Chicago Elevated Railways (preferred).....	75	75
Chicago Railways, pteptg., ctf. 1.....	93	90
Chicago Railways, pteptg., ctf. 2.....	29	29¾
Chicago Railways, pteptg., ctf. 3.....	7½	7¼
Chicago Railways, pteptg., ctf. 4.....	2½	2½
Cincinnati Street Railway.....	107½	107½
Cleveland Railway.....	103¾	103¾
Cleveland, Southwestern & Columbus Ry. (common)...	5½	*5½
Cleveland, Southwestern & Columbus Ry. (preferred)...	30	*30
Columbus Railway & Light Company.....	18	18
Columbus Railway (common).....	69½	a69½
Columbus Railway (preferred).....	88	88
Denver & Northwestern Railway.....	*111	*111
Detroit United Railway.....	69	70
General Electric Company.....	141½	140¾
Georgia Railway & Electric Company (common).....	119½	119½
Georgia Railway & Electric Company (preferred).....	85¾	85½
Interborough Metropolitan Company (common).....	14	14
Interborough Metropolitan Company (preferred).....	57½	58
International Traction Company (common).....	*40	*40
International Traction Company (preferred).....	95	95
Kansas City Railway & Light Company (common).....	*22	*22
Kansas City Railway & Light Company (preferred).....	*30	*30
Lake Shore Electric Railway (common).....	7	*7
Lake Shore Electric Railway (1st preferred).....	92	*92
Lake Shore Electric Railway (2d preferred).....	25	*25
Manhattan Railway.....	128	127
Massachusetts Electric Companies (common).....	11½	11½
Massachusetts Electric Companies (preferred).....	67	67
Milwaukee Electric Railway & Light Co. (preferred)...	*100	*100
Norfolk Railway & Light Company.....	25¾	25¾
North American Company.....	72½	72
Northern Ohio Light & Traction Company (common)...	63½	63½
Northern Ohio Light & Traction Company (preferred)...	97	97
Philadelphia Company, Pittsburgh (common).....	40	40
Philadelphia Company, Pittsburgh (preferred).....	40	40½
Philadelphia Rapid Transit Company.....	20	22¾
Portland Railway, Light & Power Company.....	56	56
Public Service Corporation.....	111	108
Third Avenue Railway, New York.....	37½	40
Toledo Traction, Light & Power Company (common)...	30	30
Toledo Traction, Light & Power Company (preferred)...	80	80
Twin City Rapid Transit Co., Minneapolis (common)...	105	104
Union Traction Company of Indiana (common).....	*13	*13
Union Traction Company of Indiana (1st preferred)...	*83	*83
Union Traction Company of Indiana (2d preferred)...	*25	*25
United Rys. & Electric Company (Baltimore).....	25½	26
United Rys. Inv. Company (common).....	18	18
United Rys. Inv. Company (preferred).....	35½	34½
Virginia Railway & Power Company (common).....	a53½	56
Virginia Railway & Power Company (preferred).....	93½	93½
Washington Ry. & Electric Company (common).....	95	93
Washington Ry. & Electric Company (preferred).....	89	88½
West End Street Railway, Boston (common).....	70	70
West End Street Railway, Boston (preferred).....	89	90
Westinghouse Elec. & Mfg. Company.....	67	66½
Westinghouse Elec. & Mfg. Company (1st preferred)...	110	110

*Last sale. a Asked.

ANNUAL REPORT

New York, New Haven & Hartford Railroad

The consolidated statement of income, profit and loss of the New York, New Haven & Hartford Railroad and all steam railroads, electric railways, steamship lines and other public utility companies wholly owned and operated by or for the account of the New Haven line for the fiscal year ended June 30, 1913, is as follows:

Revenue:		
Freight	\$41,134,782	
Passenger	44,645,766	
Mail	698,947	
Express	3,343,549	
Other transportation revenues	2,246,065	
Electric light	48,429	
Electric power	370,894	
Gas	382,306	
Water	11,185	
Other revenues	2,308,543	
Total	\$95,190,466	
Less operating expenses	65,694,518	
Gross revenue	\$29,495,948	
Net revenue from outside operations	641,061	
Total revenue	\$30,137,009	
Taxes	5,062,683	
Operating income	\$25,074,326	
Income from other sources:		
Dividends on stocks	\$2,219,751	
Interest on bonds and debentures	326,485	
Interest on unfunded securities and accounts	1,146,794	
Rentals from properties leased	410,417	
Joint facility and other rentals	656,074	
Hire of equipment	115,946	
Net profit from separately operated properties	42,581	
Miscellaneous income	61,362	
	4,979,409	
Total income	\$30,053,735	
Deductions from income:		
Interest on bonds, debentures and other liabilities	\$13,160,164	
Rentals of leased properties	6,016,533	
Joint facility and other rentals	2,934,191	
Miscellaneous deductions	283,450	
	22,394,338	
Net income for year	\$7,659,397	
Dividends on New Haven stock:		
Nos. 132 to 134, inclusive, 2 per cent each	\$10,786,308	
No. 135, 1½ per cent	2,700,255	
Total	\$13,486,563	
Less dividends on stock in the treasury of the system	1,702,720	
	\$11,783,843	
Dividends on subsidiary stock held by the public	3,187	
	11,787,030	
Deficit	\$4,127,633	

Howard Elliott, president of the company, says in part: "The most important pieces of work that have been under prosecution by the electrical department during the past fiscal year are as follows: (1) electrification of Oak Point, Harlem River, Westchester and Van Nest yards; (2) building of electrical shops at Van Nest; (3) extension of electrification from Stamford to New Haven; (4) elimination of electromagnetic induction on foreign wires in the electric zone, and (5) electrical equipment.

"The electrification of the Oak Point and Westchester yards has been completed and electric switching service inaugurated in those two yards. The Harlem River yard electrification is practically completed, and it is anticipated that the Van Nest yard will be completed in the course of a few months. The electrical shops at Van Nest have been finished and the installation of machinery is far advanced.

"The completion of the work of electrifying the main line tracks from Stamford to New Haven has been delayed on account of strike and flood conditions at the point where steel bridges for the catenary construction were being manufactured. It is hoped, however, that the work will be sufficiently advanced to permit operation between Stamford and New Haven early in 1914.

"The elimination of electromagnetic induction on foreign wires in the electric zone has been pushed as rapidly as possible, and it is expected that the new system of electric power distribution will be inaugurated early in 1914.

"The following orders for electrical equipment have been placed: Thirteen a.c.-d.c. motor cars, four a.c. motor cars, twenty trailers, straight passenger, and four trailers, passenger and baggage. The first a.c.-d.c. motor car is expected within a few months from the manufacturers, and thereafter four motor cars a month are promised until the

order is completed, followed by the trailer cars. The a.c. motor cars will not be constructed until the order for the a.c.-d.c. motor and trailer cars has been filled.

"Effective May 1, 1913, a lease was made to the Shore Line Electric Railway of the so-called New London division of the Connecticut Company, extending from New London to South Coventry, both in Connecticut, and from Moosup to a point in West Thompson, in Connecticut, consisting of 104.9 miles of road, for a term of ninety-nine years, with an option to purchase the property during the first ten years of the lease. The rental provided for is substantially the net earnings of the property for the year preceding May 1 last, and the purchase price substantially the cost of the property to the Connecticut Company."

Besides the general consolidated financial statements of the New York, New Haven & Hartford Railroad and its subdivisions, the report contains individual income statements and balance sheets for the subdivisions. The income statement of the Connecticut Company for the year ended June 30, 1913, is as follows:

Operating revenue:		
Freight revenue	\$314,804	
Passenger revenue	7,904,805	
All other revenue from transportation	127,405	
Revenue from operations other than transportation	107,611	
Total operating revenue	\$8,454,625	
Operating expenses:		
Maintenance of way and structures	\$995,973	
Maintenance of equipment	655,669	
Traffic expenses	550	
Operation of power plants	976,981	
Operation of cars	1,954,971	
General expenses	632,559	
Miscellaneous expenses	154,999	
Total operating expenses*	5,371,702	
Net operating revenue	\$3,082,923	
Taxes	496,824	
Income from operations	\$2,586,099	
Income from other sources	62,078	
Total income	\$2,648,176	
Deductions from income:		
Interest, rentals, etc.	1,039,154	
Net income	\$1,609,022	
Dividends	1,500,000	
Surplus	\$109,022	

*The operating expenses and taxes were 69.41 per cent of the total operating revenue.

Concerning the New York, Westchester & Boston Railway the report gives the following statement:

"The business of the New York, Westchester & Boston Railway during the past year has shown a satisfactory increase month by month and the company is now handling passengers at the rate of 3,000,000 per year. During the last year freight service has been inaugurated and a contract has been entered into with the Adams Express Company granting the latter company express privilege over the Westchester line. It is estimated that considerable revenue will be received from these two sources in the coming year.

"During the past fiscal year the Public Service Commission for the Second District of New York has approved a change of route of the extension of the line between New Rochelle and Port Chester from a location on the easterly side of the tracks of the New York, New Haven & Hartford Railroad and at an average distance of one-quarter of a mile therefrom to a location along the westerly side of the tracks of the New York, New Haven & Hartford Railroad and upon that company's present right-of-way. The order provides that the right-of-way required by the Westchester company, now owned by the New Haven company, is to be sold to the Westchester company. This change of route represents a saving in the cost of construction of more than \$1,500,000.

"Negotiations have been concluded with the Public Service Commission for the First District of New York for the sale to the city of New York of the right-of-way required for the extension of the Lenox Avenue branch of the subway to the New York, Westchester & Boston Railway at 180th Street. The property to be sold was originally acquired for a connection between the Westchester line and the subway to be built and operated by the Westchester company. This connection will now be built and operated by the Interborough Rapid Transit Company, representing a saving to the Westchester company of \$1,000,000 and a considerable

saving in operation. Plans are being prepared by the city of New York for this connection, and from present indications the line should be completed within the next year. The actual construction work of third-tracking the Second and Third Avenue elevated lines in New York, also operated by the Interborough Rapid Transit Company, has not yet been commenced, although plans are being prepared, and it is probable that construction work will be commenced at an early date. The earning power of the New York, Westchester & Boston Railway cannot be fully demonstrated until these various connections are completed.

"The charge to the income account of the New York, New Haven & Hartford Railroad for the fiscal year by reason of its guaranty of the interest on the bonds of the Westchester company was \$777,750; there was also a further sum of \$357,107 representing interest on bonds and notes held by the New Haven company and on advances made by it, which on account of the inability of the Westchester company to pay has not been credited to the income account of the New Haven company."

The statement of income, profit and loss of the New York, Westchester & Boston Railway for the year ended June 30, 1913, follows:

Operating revenue:		
Freight revenue	\$4,091	
Passenger revenue	268,918	
All other revenue from transportation.....	3,607	
Revenue from operations other than transportation	12,412	
Total operating revenue		\$289,028
Operating expenses:		
Maintenance of way and structures.....	\$105,477	
Maintenance of equipment	34,168	
Traffic expenses	15,781	
Transportation expenses	278,432	
General expenses	35,084	
Total operating expenses*.....		468,942
Operating deficit	\$179,914	
Taxes	105,605	
Loss from operations	\$285,519	
Income from other sources.....	9,536	
Total loss		\$275,983
Deductions from income:		
Interest on bonds and other liabilities	\$1,073,638	
Miscellaneous rents	51,713	
Amortization of discount on securities	4,665	
Total deductions from income		1,130,016
Deficit		\$1,405,999

*The operating expenses and taxes were 198.79 per cent of the total operating revenue.

The earnings of the Rhode Island Company for the period ended June 30, 1913, are shown by the following statement:

Operating revenue:		
Freight revenue	\$230,644	
Passenger revenue	4,900,951	
All other revenue from transportation	61,131	
Revenue from operations other than transportation	129,921	
Total operating revenue		\$5,322,647
Operating expenses:		
Maintenance of way and structures	\$430,069	
Maintenance of equipment.....	349,130	
Traffic expenses	2,678	
Operation of power plants	486,054	
Operation of cars	1,256,349	
General expenses	495,341	
Miscellaneous expenses	116,816	
Total operating expenses*.....		3,136,437
Net operating revenue	\$2,186,210	
Taxes	425,176	
Income from operations	\$1,761,034	
Income from other sources	134,336	
Total income		\$1,895,370
Deductions from income:		
Interest, rentals, etc.	1,225,319	
Net income		\$670,051
Dividends	581,130	
Surplus		\$88,921

*The operating expenses and taxes were 66.91 per cent of the total operating revenue.

According to an income statement shown in the report, the operating revenue of the Berkshire Street Railway system for the year ending June 30, 1913, was \$979,068, from which operating expenses of \$860,976 and taxes of \$46,720 were deducted, leaving an income from operations of \$71,371. Income from other sources amounted to \$1,430, giving

a total income of \$72,801, from which, after deductions from income to the extent of \$164,662, there remained a deficit of \$91,861.

The income statement of the Millbrook Company for the year ended June 30, 1913, showed miscellaneous rent revenues, interest revenues and miscellaneous non-operating revenues to the extent of \$75,516, from which rent expense of \$31,767, non-operating taxes of \$45,789 and interest accrued of \$177,103 were deducted, causing a deficit of \$179,143. No credit was made on the New Haven books for accrued interest on unfunded debts amounting to \$176,803 on notes of the Millbrook Company held by the New Haven Company. The Millbrook Company is the owner of a large amount of real estate purchased originally for the proposed route of the Westchester line. Such of this real estate as was not acquired for actual right-of-way is in the market for sale, and as fast as sold the proceeds will be available for application to the payment of a note of \$3,536,062 held by the New Haven company and also to interest thereon to June 30, 1913, amounting to \$324,139.

The operating revenue of the New York & Stamford Railway for the year ended June 30, 1913, was \$370,100. Operating expenses were \$302,019 and taxes \$18,297, which left an income from operation of \$49,783. Income from other sources amounted to \$407 and deductions for interest, rentals, etc., \$86,747, giving a deficit of \$36,556.

The Westchester Street Railroad showed for the year ended June 30, 1913, a total operating revenue of \$242,507, from which deductions were made for operating expenses of \$274,865 and taxes of \$11,140, leaving an operating deficit of \$44,298. The income from other sources was \$220 and deductions from income \$10,676, or a total deficit of \$54,753.

The above information is supplemental to that published in the ELECTRIC RAILWAY JOURNAL of Oct. 11, 1913, regarding the New York, New Haven & Hartford Railroad.

First Hearing on Modified Plan of Reorganization of Buffalo & Lake Erie Traction Company

At the first hearing before the Public Service Commission of the Second District of New York on the modified application on the part of the Canadian-American Power Corporation to import 46,000 hp to operate cars of the new Frontier Electric Railway, the Buffalo & Lake Erie Traction Company and other corporations, held on Oct. 24, opposition developed to the capitalization of the new company at \$3,000,000. The matter was first brought before the commission as part of the reorganization plan of the Buffalo & Lake Erie Traction Company and called for the reorganized company to acquire the \$3,000,000 of capital stock of the new power corporation. Henry W. Killen, counsel for the parties entering the objection, in a statement filed with the commission said:

"Public policy and sound reasoning alike forbid the capitalization of a contract by a public service corporation for the same reasons which forbid the capitalization of a franchise and the commission has already decided along this line."

The statement went on to the effect that the contract with the Electrical Development Company, Niagara Falls, Ont., might be terminated at any time as the Electrical Development Company cannot transport the current without a license from the Canadian government, which license must be renewed annually. All that the Canadian-American Power Corporation controls is a contract with the Canadian Power Company at Niagara Falls, Ont., for the importation of 46,000 electrical hp at \$12.50 per hp.

Chairman Decker of the commission objected to the 8 per cent cumulative stock which the company proposes to issue. He pointed out that the commission was inclined to consider 6 per cent a reasonable return.

Among those who attended the hearing were Charles S. Beekman, New York, counsel for the Canadian-American Power Corporation; Thomas Penney, former president of the International Railway, now counsel for the company; Glenn M. Congdon, representing William F. Sheehan and Joseph B. Mayer, New York; Edward G. Connette, president of the International Railway and a director in the new Canadian-American Power Corporation, and others.

The hearing was adjourned until Oct. 31.

Annual Meeting of Chicago Railways

The annual meeting of the Chicago Railways on Oct. 24 resulted in the election of the retiring board of directors with the exception that John A. Chapman was chosen to fill the vacancy caused by the resignation of Charles L. Hutchinson. The proxy committee reported the vote as follows: ticket headed by Henry Blair and others, 128,147; ticket headed by Joseph Beifeld and others, 41,567; not voting, 42,809; total number participation certificates, 212,523.

The opposition to the present management of the company which was voiced in the vote for the ticket headed by Joseph Beifeld was organized last spring.

The purpose of the meeting on Oct. 24 was clearly set forth to the holders of the participation certificates in a communication addressed to them early in October by the proxy committee of the company, consisting of Wallace Heckman, Seymour Morris and Henry A. Blair. In this communication the following interesting reference was made to the progress of the negotiations for the unification of operation of the Chicago Railways and the Chicago City Railway:

"Negotiations have been carried on for some time with the Chicago City Railway looking to the possible unification of operation between that company and the Chicago Railways. The proposed agreement will relate only to the joint operation of the properties of the two surface railways. No agreement has been entered into, but it is fair to say that the negotiations have reached a point where the management is prepared to recommend an agreement drawn along the lines discussed, provided that the City Council will authorize the agreement and in connection therewith will make certain concessions to the companies.

"No agreement of any character will be entered into until a copy of the proposed agreement with a full explanation of the various features involved therein shall be delivered to each and every participation certificate holder of series 1, series 2, series 3 and series 4 at least thirty days before such agreement shall be entered into, and until such agreement shall be approved in person or by proxy by a majority of the total amount of equal parts represented by all of the participation certificates, series 1, series 2, series 3 and series 4, issued and outstanding under the participation certificate agreement hereinabove mentioned.

"The counsel of the company has already stated to the local transportation committee of the City Council that the entering into the agreement by the Chicago Railways is contingent upon its previous approval by a majority of all the equal parts represented by all participation certificates outstanding under the participation certificate agreement."

Pennsylvania Railroad's Proposed New Financing

Samuel Rea, president of the Pennsylvania Railroad, has issued the following statement in regard to the plan of the company to create a \$1,000,000,000 blanket mortgage:

"Under this mortgage it is contemplated to issue bonds in such amounts from time to time as may be required to provide necessary conditions, betterments and improvements to its railroads, equipment, property and facilities, as well as the funds that may be necessary to meet maturing obligations, and for such other corporate purposes as may now or hereafter be duly authorized by law. The aggregate amount of bonds that may be issued shall not at any time exceed the outstanding capital stock.

"When approved by the directors the whole question will be laid before the stockholders for their consideration at the annual meeting in March next. The company has no expenditures that require immediate financing, but desires to announce the contemplated preparations for the necessary refunding and capital expenditures in 1914, 1915 and later years, which it will be able to meet through the issue of either capital stock, consolidated (first) mortgage bonds, the new general mortgage bonds, or such other form of financing as will produce the best results for the company and meet the monetary conditions prevailing at the time of issue."

An official of the railroad explains that the one-billion-dollar mortgage is strictly for making betterments, providing for improvements in the way of electrifying the

road, reducing grades and erecting bridges. He also explains that such a step is necessary for the purpose of cutting down the fixed charges. The additional funds, representing the difference of about \$850,000,000, the present liability of the Pennsylvania properties, and the billion dollars to be obtained by the mortgage, will be used in betterments, as will the money saved in fixed charges. The first important redemption to be met by the Pennsylvania Railroad, some \$85,000,000, will come in 1915.

Ruling in Regard to Pledging of Bonds as Collateral in New Jersey

The Board of Public Utility Commissioners of New Jersey has issued a general memorandum in the matter of the pledging of their bonds as collateral by public utility companies. The board directs the attention of the companies subject to its jurisdiction to the statutes relating to the issuance, sale and delivery of stock and securities by corporations of the State and to the act to create a board of public utility commissioners. The board does not, in the absence of a specific case before it, determine that the first of these statutes wholly prevents the use by the corporations to which it applies of their bonds as collateral for loans, nor does it determine under what, if any, conditions the statute permits such use of bonds. It considers it, however, the part of prudence to suggest these questions to the companies subject to the provisions of the statute and to the jurisdiction of the board, and directs attention to the case of Pfister et al. v. Milwaukee Electric Railway et al. (Wis., 53 N. W. Rep. 27), an action involving validity of 250 bonds of the defendant company for \$1,000 each, delivered by the company to the plaintiff, Pfister, as a collateral security for a loan of \$125,000 made by him to the company.

The board determines, however, that, if the first of these statutes admits, under any circumstances, the use by the companies of their bonds as collateral for loans, such use constitutes an "issue" of bonds under the second of these statutes and that such issue requires authorization by the board.

Alabama Traction, Light & Power Company, Ltd., New York, N. Y.—The London Stock Exchange has listed \$10,000,000 of first mortgage 5 per cent bonds of the Alabama Traction, Light & Power Company, dated July 1, 1912, in lieu of receipts for these bonds. The bonds are secured by developed and undeveloped water-power sites in Alabama and also deposit under them of first mortgage bonds of Alabama Power Company, of which an issue of \$20,000,000 has been authorized.

American Cities Company, New York, N. Y.—Bertron, Griscorn & Company, New York, N. Y., announce that more than 70 per cent of the common stock of the American Cities Company has been deposited under the offer to exchange \$75 par value of second preferred and \$25 par value of common stock of the United Gas & Electric Corporation for each \$100 share par value of stock of the American Cities Company. The United Gas & Electric Corporation has extended the time in which it will purchase American Cities Company common stock on these terms to Nov. 10.

Brooklyn (N. Y.) Rapid Transit Company.—The suit of the Brooklyn Rapid Transit Company against the Brooklyn City Railroad, which has been pending since April, 1900, is said to have been settled out of court for \$1,500,000. In 1900 the Brooklyn Rapid Transit Company began suit against the Brooklyn City Railroad to recover \$2,000,000 claimed to be due under the terms of the lease as the result of the failure of the Brooklyn City Railroad to fulfil certain obligations imposed by the lease. A referee was appointed and after several years a decision was rendered giving judgment of \$1,740,258 for principal against the Brooklyn City Railroad and \$1,616,680 for interest. Subsequent appeals through the New York courts resulted in striking out the award of interest, but the judgment of \$1,766,892 for principal has been sustained. The last appeal was taken in July, 1912, to the New York Court of Appeals.

Columbus Railway & Light Company, Columbus, Ohio.—The period for depositing securities for the consolidation of the railway and lighting properties at Columbus, Ohio,

will expire on Nov. 15. The stockholders of the Columbus, Light, Heat & Power Company have filed an amended petition to their complaint protesting against the terms of the consolidation in Judge Dillon's court, where their objections were recently overruled.

Columbus, Urbana & Western Railway, Columbus, Ohio.—L. P. Stephens and Edward W. Zigler, receivers of the Columbus, Urbana & Western Railway, have asked the court for an order making Smith W. Bennett, trustee, a defendant in the action and that he be required to set up the number of bonds outstanding and the nature of his trust. The receivers state that, after paying operating expenses, they have nothing to apply upon the indebtedness of the company, which they say is \$438,000, to the best of their knowledge. The petition states that the outstanding capital stock amounts to \$280,500; notes, \$29,495; overdrafts, \$2,164, and other indebtedness, \$4,000.

Dedham & Franklin Street Railway, Westwood, Mass.—Eugene H. Mather, as receiver of the Dedham & Franklin Street Railway, has reported to the Supreme Court that under its instructions he sold the franchise and the property of the company on Sept. 15 for \$10,000 to H. M. Verrill, Portland, Maine, and R. H. Johnson, Cambridge. They are acting as a committee for the bondholders.

Grand Valley Railway, Brantford, Ont.—On the application of counsel for the Grand Valley Railway, Chief Justice Meredith, in the non-jury Assize Court on Oct. 23, modified his judgment in regard to the forfeiture of the company's franchise to operate street cars in Brantford. The time given to the company to elect whether or not it will comply with the conditions imposed has been extended to Nov. 23. These conditions now include the placing of modern cars in service within a year, the construction within the same period of lines on five streets, the operation of cars to West Brantford along Oxford Street to the end of the line within thirty days after the completion of the bridge by the city and the payment before Jan. 23, 1914, of all moneys in arrear. The company is also ordered to pay \$100 each month to the city. Unless these conditions are complied with, the city is to take possession of the streets, but not of the assets of the company.

Interborough Rapid Transit Company, New York, N. Y.—In a brief filed with Supreme Court Justice Van Sicken by attorneys for the defendants in the suit brought by Clarence H. Venner and the Continental Securities Company as minority stockholders against August Belmont, Andrew Freedman and others, and the Interborough Rapid Transit Company, the motives and character of the action are assailed. Mr. Venner's suit is based upon an allegation of fraud on the part of the original board of directors in the purchase from August Belmont & Company of the stock and charters of the Pelham Park & City Island Railway. In referring to Venner's motives in the litigation the brief quotes from a decision of Chief Justice Sawyer in the federal court, which in part reads: "It is always a suspicious circumstance where a single stockholder among a number in a corporation rushes into a court of equity to vindicate, unaided and alone, the rights of the corporation and all other stockholders; and especially is this so where the amount of stock owned by him is so very limited that in case of success his own share of the recovery will be so small as to make the maxim *de minimis non curat lex* very properly applicable." The brief contends also that the plaintiff's cause of action as pleaded is for actual fraud on the corporation and that no actual fraud has been proved. Therefore, the contention is made that the plaintiff is not permitted to ask consideration of his case on the theory of "constructive fraud" or any other theory, "particularly since there is a complete variance between the facts alleged and the facts proved." The entire issue of Interborough Rapid Transit Company forty-five-year 5 per cent bonds will be redeemed at the office of the trust department of the Guaranty Trust Company at 105 and accrued interest on and after Nov. 1.

Louisville (Ky.) Traction Company.—Frederick S. Wicks, representing the Major Alexander H. Davis estate, has denied knowledge of negotiations for the purchase of the 33,000 shares of stock in the Louisville Traction Company owned by the estate. Mr. Wicks, who is a director of the

corporation, is reported to have said that a suggestion of a possible purchase had been made to him some time ago, but that nothing ever came of it.

New York, New Haven & Hartford Railroad, New Haven, Conn.—Morgan G. Bulkeley, Hartford, on behalf of himself and other stockholders of the New York, New Haven & Hartford Railroad, has asked the Supreme Judicial Court of Massachusetts to pass upon the legality of the action of the Public Service Commission of Massachusetts in permitting the company to issue \$67,000,000 of convertible bonds. The principal ground for the appeal is that the present indebtedness of the company is \$202,844,450, and that as guarantor of obligations it is liable for the further sum of \$79,648,900. The appellants contend that the Public Service Commission exceeded its powers in authorizing a new bond issue. The appeal of Mr. Bulkeley came up in the Supreme Court on Oct. 28. C. F. Choate, representing the company, said that he would file his answer on or before Nov. 7. Justice Loring said that he would fix a time for the hearing as soon as Mr. Choate's answer was filed.

New York (N. Y.) Railways.—The New York Railways has applied to the Public Service Commission of the First District of New York for authority to acquire capital stock in various companies and a hearing has been ordered for Nov. 6. Included in the application are 15,000 shares of the People's Traction Company and the same amount of the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad, although the latter company has been superseded by the Mid-Crosstown Railroad, which is being operated by the Third Avenue Railway. The Eighth Avenue Railroad, a subsidiary of the New York Railways, has applied to the Public Service Commission of the First District of New York for authority to issue \$750,000 certificates of indebtedness in \$100 and multiples thereof, bearing interest at 6 per cent and payable on or before Feb. 1, 1934.

Ocean Shore Railroad, San Francisco, Cal.—Judge Seawell has decided against the plaintiffs in the suit brought by John McGinty and others to compel the trustees of the Ocean Shore Railroad to give them bonds of the new company instead of stocks for the bonds which they held of the old company. The court says that the holders of the bonds of the old company could have foreclosed under the trust deed against the assets, but instead of doing this they assigned their securities to the reorganization committee and permitted the latter to go ahead with the reorganization. They thus became parties to the reorganization and were barred from exercising their original rights as bondholders. The court says that they cannot now be permitted to have their claims secured by bonds since the reorganization has been carried into effect.

Rock Island Southern Railway, Monmouth, Ill.—A meeting of the stockholders of the Rock Island Southern Railway has been called for Nov. 29 at Rock Island to vote upon an increase in the capital stock to \$3,550,000, to consider a bond issue of \$20,000,000 and if a bond issue is authorized to increase the capital stock to not to exceed \$20,000,000, to consider and authorize the construction of a line into Rock Island, to authorize the purchase of any railway for a part of this line if necessary, and to amend the charter so that the company can operate its line into and through Alexis.

Seattle, Renton & Southern Railway, Seattle, Wash.—Negotiations looking toward the purchase by the city of the Seattle, Renton & Southern Railway were halted on Oct. 17 when Attorney Howard Hughes, representing the bondholders' committee and Peabody, Houghteling & Company, said that the bondholders' committee and Peabody, Houghteling & Company would consent to a transfer of the property on the basis of \$400,000 worth of general fund car-line bonds from the issue voted in 1911; \$100,000 in the form of a warrant in the condemnation case now pending for the widening of Rainer Avenue, the remainder of \$700,000 to be in utility bonds secured by the earnings of the system to be taken over by the city. Mr. Hughes also said that his clients would deposit \$150,000 in cash with the city to insure the three branch lines now under discussion, and provide the money to do the work through the purchase of general fund car-line bonds. All of this, Mr.

Hughes says, is conditional on the State of Washington purchasing at par value \$400,000 of the issue of street railway bonds voted in 1911, only \$500,000 of which remains. These terms differ from those proposed by the receivers of the company, and the purchase by the city will be held in abeyance pending a decision by the courts.

Union Street Railway, New Bedford, Mass.—At the annual meeting of the stockholders of the Union Street Railway held on Oct. 17 it was voted to authorize an issue of \$2,000,000 of 4½ per cent twenty-year mortgage bonds, callable after five years at 115, at the option of the company, on any coupon day. These bonds will be issued from time to time as the needs of the company may require.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 1¼ per cent, preferred.

Easton (Pa.) Consolidated Electric Company, 2 per cent.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly, 1½ per cent, preferred.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, quarterly, 1¼ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$13,862	*\$9,422	\$4,440	\$2,126	\$2,314
1 " " '12	11,767	*7,519	4,248	1,736	2,517
12 " " '13	153,695	*93,473	60,132	23,253	36,879
12 " " '12	139,583	*84,327	55,257	34,498	34,498

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$17,289	*\$9,253	\$8,037	\$1,096	\$6,940
1 " " '12	11,958	*9,145	6,813	1,030	5,783
12 " " '13	124,842	*95,708	29,134	13,005	16,129
12 " " '12	120,415	*90,207	30,208	12,537	17,671

CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$33,454	*\$17,299	\$16,154	\$6,082	\$10,072
1 " " '12	31,598	*16,100	15,498	5,703	9,795
12 " " '13	375,071	*202,584	172,487	71,070	101,418
12 " " '12	350,103	*192,578	157,524	68,030	89,494

COLUMBUS (GA.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$50,403	*\$23,706	\$26,698	\$24,489	\$2,209
1 " " '12	50,824	*23,313	27,511	18,952	8,558
12 " " '13	639,591	*293,482	346,109	249,380	96,729
12 " " '12	600,787	*268,302	332,485	223,853	108,632

DALLAS (TEX.) ELECTRIC CORPORATION

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$180,735	*\$103,645	\$77,089	\$25,011	\$52,078
1 " " '12	147,352	*88,229	59,122	24,666	34,455
12 " " '13	2,072,483	*1,202,222	870,263	296,289	573,970
12 " " '12	1,746,018	*1,104,541	641,477	270,127	371,350

EL PASO (TEX.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$65,590	*\$37,078	\$28,512	\$5,785	\$25,947
1 " " '12	63,401	*35,314	28,086	5,359	22,727
12 " " '13	867,855	*467,492	400,363	57,830	360,867
12 " " '12	750,768	*415,656	335,111	79,869	255,242

GALVESTON-HOUSTON ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$223,139	*\$118,014	\$105,126	\$34,644	\$70,482
1 " " '12	199,208	*103,921	95,287	33,666	61,621
12 " " '13	2,289,112	*1,308,638	980,474	412,532	567,942
12 " " '12	1,835,279	*1,099,285	735,995	347,511	388,484

JACKSONVILLE (FLA.) TRACTION COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Aug. '13	\$55,255	*\$34,537	\$20,718	\$12,976	\$7,742
1 " " '12	48,856	*33,471	15,385	9,934	5,451
12 " " '13	607,296	*403,451	203,845	133,202	70,643
12 " " '12	588,981	*373,610	215,371	114,147	101,224

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo. Sept. '13	\$250,813	*\$151,023	\$99,791	\$44,086	\$55,705
1 " " '12	224,138	*132,072	92,066	43,974	48,092
9 " " '13	2,192,176	*1,342,494	849,682	405,872	443,810
9 " " '12	1,926,296	*1,171,466	754,830	397,443	357,387

*Includes taxes.

The South Laneashire scheme for the carriage of goods over various tramway systems between Liverpool and Manchester is making progress. The idea is to load specially-constructed cars at the docks, and by running through the night be in a position to deliver goods early the following morning in any of the towns that are linked together by tramways. The scheme, if adopted, will involve the construction of certain new lines, establishment of depots at various places, and the organization of motor-lorry services for conveying the goods from tramways to the consignees' premises.

Traffic and Transportation

Accidents on Interstate Electric Railways

The Interstate Commerce Commission, Washington, D. C., has issued a summary for the three months ended March 31, 1913, of the casualties to persons on steam railroads and electric railways under its jurisdiction. The total number of casualties of all classes reported for steam railroads amounted to 2341 for persons killed and 47,634 for persons injured. This statement includes 2086 persons killed and 17,194 persons injured as the result of accidents sustained by employees while at work, by passengers getting on or off cars, by persons at highway crossings, by persons doing business at stations, etc., as well as by trespassers and others, and also ninety-seven person killed and 26,812 persons injured in casualties reported as "industrial accidents," which term covers accidents not involved in train operation but occurring to railway employees, other than trainmen, on railway premises. The report for interstate electric railways by themselves shows that the number of those killed during the three months was seventy-two, or 2.9 per cent of the total on both steam and electric lines, and the list of injured numbered 1281, or 2.62 per cent of the total.

From the statement of the commission, which is appended, the columns have been eliminated which show casualties to employees not on duty and to trespassers. Of the former class one was killed and eight injured, while twenty trespassers were killed and twenty-five injured. The summary, with these eliminations, is as follows:

Causes.	Number of Accidents.	Passengers Killed.	Passengers Injured.	Employees on Duty Killed.	Employees on Duty Injured.	Other Persons Not Trespassing Killed.	Other Persons Not Trespassing Injured.	Total Persons Killed.	Total Persons Injured.
Collisions	51	1	308	1	30	..	..	2	340
Derailments	14	..	37	2	5	..	..	3	43
Accidents to trains, cars or engines, except collisions, derailments and boiler explosions .....	..	..	..	..	..	..	..	..	..
Bursting of, or defects in, locomotive boilers or boiler attachments.....	..	..	..	..	..	..	..	..	..
Total train accidents...	65	1	345	3	35	1	..	5	383
Accidents to roadway or bridges not causing derailment, such as fires, floods, landslides, explosions, etc.....	4	..	..	..	..	..	..	..	..
Coupling or uncoupling cars (exclusive of accidents with air or steam hose) .....	**	..	..	..	8	..	..	..	8
While doing other work about trains (not in shops or engine houses) or while attending switches .....	**	..	..	1	34	..	..	1	34
Coming in contact while riding on cars with overhead bridges, tunnels, or any signal apparatus or fixed structure above or at side of track.....	**	..	6	1	5	..	..	1	11
Falling from cars or engines	**	1	19	..	12	..	..	1	32
Getting on or off cars or engines	**	1	266	..	18	..	3	1	296
Other accidents on or around trains not here named	**	..	61	..	2	..	22	..	86
Being struck or run over by engines or cars at stations or yards .....	**	..	..	2	2	3	6	7	9
Being struck or run over by engines or cars at highway grade crossings	**	..	..	..	..	16	118	16	120
Being struck or run over by engines or cars at other places.....	**	..	1	..	4	11	59	29	79
Other causes	**	1	29	1	1	2	..	5	31
Total, other than train accidents	**	3	382	5	86	32	208	61	706
Grand total, exclusive of industrial accidents...	**	4	727	8	121	33	208	66	1,089
Industrial accidents to employees .....	**	..	..	6	192	..	..	6	192
Grand total	**	4	727	14	313	33	208	72	1,281

The bulletin published by the commission also contains the following statement of the collisions and derailments on the interstate electric railways during January, February and March, 1913:

Classes	Number	Number of		Damage to Road and Equipment and Cost of Clearing Wrecks
		Killed	Injured	
Collisions:				
Rear	26	2	254	\$16,023
Butting	9	..	43	20,234
Train separating .....	..	..	..	..
Miscellaneous	16	..	43	9,704
Total	51	2	340	\$45,961
Derailment due to—				
Defective roadway	2	..	2	\$125
Defects of equipment	1	..	2	..
Negligence of trainmen, signalmen, etc. ....	..	..	..	..
Unforeseen obstruction of track, etc.	1	..	1	970
Malicious obstruction of track, etc. ....	..	..	..	..
Miscellaneous causes	10	3	38	1,081
Total	14	3	43	\$2,176
Total collisions and derailments	65	5	383	\$48,137
Total for same quarter of—				
1912	79	5	402	48,074
1911	52	1	195	10,173
1910	52	5	352	37,087

Chicago Elevated Railways Begin Through Route Operation

On Nov. 3 the work of rearranging the Chicago elevated loop structure, providing overhead transfer bridges and extending platforms for through routing of elevated trains will have progressed far enough to permit beginning operation as provided under the ordinance passed by the Chicago City Council on July 21, 1913. Under this ordinance the elevated railways will begin operation with universal transfers and a single 5-cent fare throughout the city. In order to provide for a universal transfer of passengers in the loop district, four overhead transfer bridges have been constructed.

The through route elevated trains will be arranged between the Northwestern Elevated Railroad, extending north of the business district of Chicago, and the South Side Elevated Railroad, extending south of the business district. According to the plan adopted by the elevated railways, which will be put in operation Nov. 3, through route trains will be run over the Northwestern and the South Side Elevated Railroads from early in the morning until late in the evening. During the remainder of the twenty-four hours all trains will go around the loop and passengers may transfer at the transfer stations. The through route service will be divided into through express trains making only designated stops and through local trains which will continue to stop as at present at all stations.

This arrangement of operation will make it necessary to change the operation of trains on the Northwestern elevated lines from left-hand to right-hand movement, and all the Northwestern and South Side elevated trains will be run over the outside track of the double-track loop. The trains of the Metropolitan West Side Elevated Railway and the Chicago & Oak Park Railroad will use the inside loop track.

It is not contemplated at this time that through route service will be put in operation either on the Metropolitan or the Oak Park elevated divisions. In order to facilitate transferring between the four divisions of the elevated railways, a shuttle train service will be operated around the loop during the periods outside of the morning and evening rush hours. Under this new plan of operation it is estimated that the capacity of the loop structure will be increased from 700 cars per hour to approximately 1200 cars per hour. Under the present method of operation, that is, looping all trains from the four divisions, the loop has been the controlling factor. The increased capacity under the new method of operation will not be limited by track facilities on the various divisions of the elevated railways leading from the loop to the outlying districts of the city.

Order in Regard to Height of Car Step in New Jersey.—The State Board of Public Utility Commissioners of New Jersey has issued an order directing the Public Service Railway to put no more new cars in service with a first step exceeding 15 in. in height and a second step exceeding 14 in.

New York State Railways Changes Rates.—Changes of rates have been filed by the New York State Railways with the Public Service Commission, Second District, State of New York, in regard to local fares between Mohawk and certain stations and local cash fares over the motor bus line from Utica to certain stations.

Interurban Terminal Station Proposed for Kansas City.—A meeting of representatives of all electric railways now running into Kansas City will be called in the near future to discuss plans further for a terminal station. A recent conference resulted in no decision, though four sites are under consideration. The meeting will be held as soon as a decision is reached in regard to the Metropolitan Street Railway franchise.

Fare Complaint Filed with Nebraska Commission.—A complaint has been filed with the State Railway Commission of Nebraska by James A. Davis asking that the Omaha & Council Bluffs Street Railway be compelled to sell six tickets for a quarter. The complaint asks that the rule be put in effect on all of the company's lines in Omaha, Florence, Benson, Dundee, South Omaha and Albright, good from any point in one city to any point in any of the other cities mentioned.

Accident on New Interurban Line.—The motorman and three passengers were instantly killed and twenty-three out of twenty-seven passengers were injured on the new Dallas-Waco interurban line on Oct. 14 when a flat car loaded with ties crashed into a southbound interurban car, about 2½ miles south of Dallas, where the Southern Traction Company's interurban tracks cross the Santa Fé overhead. Passenger service on the Dallas-Waco interurban line had been inaugurated two days prior to the accident.

New Club House in Kansas City.—The Metropolitan Street Railway, Kansas City, Mo., has decided to give \$10,000 toward the erection of a club house for car crews while off duty. The new structure will be built at Ninth Street and Lister Avenue. It will be two stories high. The second floor will be devoted to a gymnasium, shower baths, billiard and pool tables and a library. Work will begin on the building in the near future, and the structure will probably be ready for occupancy early in 1914.

New Mileage Books on Sale on Buffalo Line.—The Buffalo & Lake Erie Traction Company is advertising that it will place on sale at all regular agencies interchangeable 1000-mile mileage books for \$15. These will be good for passage over the Buffalo & Lake Erie Traction Company between Buffalo, N. Y., and Erie, Pa.; Cleveland & Erie Railway, between Erie, Pa., and Conneaut, Ohio; Chautauqua Traction Company, between Westfield and Jamestown; Northwestern Pennsylvania Railway, between Erie, Meadville and Linesville, Pa.

Automobile Ordinance Passed in Kansas City.—The City Council of Kansas City, Mo., has passed an ordinance making it a misdemeanor for an automobile driver to run past a street car which is taking on or discharging passengers. All drivers must stop within 10 ft. of such cars. The need of the ordinance was emphasized by a number of accidents, caused in most instances by autos running down passengers as they dismounted from the cars. The Kansas City Motor Car Dealers' Association may test the constitutionality of the measure.

New Poster of Lake Shore Electric Railway.—The Lake Shore Electric Railway, Cleveland, Ohio, has printed a poster calling attention to the present conveniences of travel. The poster is 11 in. x 17½ in. in size, and is printed in red and blue. It is put up in fronts of compartments where it can be read by the passengers. The poster reads as follows: "Consider the conveniences of the modern mode of travel as compared with those before the advent of the interurban. We appreciate your patronage of the past and solicit a continuance for the future."

Use of Trains Being Considered in Syracuse.—B. E. Tilton, general manager of the New York State Railways,

Syracuse Lines, is quoted as follows in regard to the possible use of trailers in Syracuse: "It is only a question of time when 'trailers' or two-car trains will be placed on the Syracuse lines of the New York State Railways in an effort to relieve the rush-hour congestion. We are seriously considering the proposition, and if investigation proves its adaptability to existing conditions an amount to cover the necessary addition to equipment will be included in next year's budget."

Washington State Public Service Commission Sets Dates of Hearings.—The Public Service Commission of the State of Washington has set the following dates when complaints against the Puget Sound Traction, Light & Power Company and other public service corporations will be heard: Duwamish Valley complaints against the Puget Sound Electric Company, Seattle, Oct. 30; continuation of 4-cent fare case against the Puget Sound Traction, Light & Power Company, Seattle, Oct. 31; car-heating case against the Puget Sound Traction, Light & Power Company, Seattle, Nov. 6; rate complaint against the Northwest Traction Company, Everett, Nov. 6.

Trolley Pleasure Trips from Los Angeles.—An attractively illustrated folder, describing in popular narrative style the pleasure of four special trolley trips to points of interest near Los Angeles, has been issued by the Pacific Electric Railway. The four trips suggested are as follows: from Los Angeles to the top of Mount Lowe; the Balloon Route trolley trip, including a 30-mile ride along the ocean beach from Santa Monica; the "Triangle" trolley trip, visiting the ships at San Pedro, and the "Old Mission" trolley trip to Pasadena and the orange groves along the foothills, including a visit to the San Gabriel Mission and the Cawston ostrich farm.

Rearrangement of Toronto Street Car Routes to Be Given Fair Trial.—Until the Terauley Street line is in operation and the Toronto (Ont.) Railway has had a chance to show what a rearrangement of its routes based upon the use of the new line can do in the way of relieving the traffic congestion, the Ontario Railway & Municipal Board will not appoint an independent expert to report upon means of relieving the situation. At the last hearing of the city's application before the board Chairman McIntyre announced that the board in addition to having Engineer Middlemiss report on the Terauley Street delay would appoint a traffic expert to make an independent report.

Price Cannot Control Rates.—In a ruling which it handed down on Oct. 28, the Interstate Commerce Commission laid down this significant general principle: "If, when viewed in the light of those considerations which enter into proper rate-making, a particular rate is fair and just for the service performed, the price at which the shipper markets his product cannot be accepted as the controlling factor in fixing the rate." It is explained that if, on account of an over-supply or for any other reason, the price falls to a low figure in a particular market, that cannot be considered as controlling the freight rate to that market. The commission holds that the railroads are entitled to a fair return for the transportation service.

Joint Railway and Ferry Fare Held in Abeyance.—When the report of a Board of Estimate committee on the exchange of transfers between the New York Railways and the municipal ferry to Staten Island was submitted to the sinking fund commission recently the matter was referred to a committee of the sinking fund, consisting of Alderman Curran and the city chamberlain. The New York Railways agreed to exchange transfers between its surface lines terminating at South Ferry and the municipal ferry, upon the basis of a division of a 5-cent fare, 3 cents to the company and 2 cents to the city. The report of the committee of the Board of Estimate recommended that the commissioner of docks be authorized to enter into a contract with the company.

Near-Side Stop in Detroit.—If the majority is to rule, the near-side stop, proposed by Police Commissioner Gillespie and adopted by the Common Council at his suggestion, will remain in effect in Detroit. After several weeks of balloting by the patrons of the company the vote showed that the near-side stop has received 51 per cent of the total against 49 per cent for the return to the far-side stop.

The Detroit United Railway announced before the ballot was taken that it was neutral on the question and would be pleased to abide by whatever decision the car riders reached. But the operating department believes that the near-side stop should be given a trial of at least one year, particularly through one winter season, before any change is effected.

Influence of Public Service Corporation in the Development of Meridian.—The Meridian (Miss.) *Despatch* in a descriptive article praises the Meridian Light & Railway Company for having won "the good will and consideration of the community in which it is operated through its liberal policies, fair and equitable treatment of the public and efficiency of its service in every department." A notable benefit that has been derived from the street railway service of this public service corporation has been the enhancement of real estate values in suburban territory traversed by its lines. Induced by the facilities thus offered, people of moderate means have been able to build homes of their own at a cost less than that demanded in the more densely populated districts of the city and to go to and from their daily work in less time than that required when they lived in more central parts, dispensing with the street car.

Transfer Question Before the Washington (D. C.) Commission.—Additional hearings will probably be held by the Public Service Commission of the District of Columbia to determine whether in justice to the Washington Railway & Electric Company and the Capital Traction Company an order should be issued to require the companies to adopt a universal system of transfers. At a recent hearing before the commission counsel for the companies contended that the adoption and enforcement of an order by the commission for universal transfers would amount to confiscation of property rights. The members of the commission have intimated that they would be within their rights in ordering universal transfers in view of the act of Congress of 1894 which requires the Metropolitan Railroad, now the Washington Railway & Electric Company, "to make reciprocal transfer arrangements with street railroad companies whose lines connect with its lines."

Filing of Schedules in Missouri.—According to an order of the Missouri Public Service Commission taking effect Oct. 6, 1913, street railway corporations engaged in the transportation of persons or property within the State of Missouri must file with the commission, at its office in Jefferson City, free of all expense, and print and keep open to the public inspection at all its offices and stations in the State where tickets are sold or passengers or freight are received or forwarded, schedules showing the rates, fares and charges for the transportation of persons and property applicable to and from such stations to and from points within the State upon every route leased, operated or controlled by it, and all points within the State upon the route of every common carrier whenever a through route and a joint rate exist between any two such points. Schedules filed with the commission prior to July 1, 1913, and schedules filed with the former Board of Railroad & Warehouse Commissioners prior to April 15, 1913, which are still in force must be refiled with the commission not later than Dec. 31, 1913.

Hearing in Regard to Smoking in New York.—On Oct. 23 the Public Service Commission for the First District of New York held a hearing upon a petition for an order directing the operating companies to provide smoking cars or compartments for smokers on the elevated and surface car lines of the city. The petition was sent in by the United Cigar Stores Company, which circulated it for signatures at its stores. It was claimed that the petition contained the names of 72,000 signers. It was one of the largest hearings ever held by the commission, and several addresses were made for and against the proposal. As a rule, the representatives of the transportation companies opposed the proposition, both on the ground of expense and the difficulty of separating smokers and non-smokers. The order of the commission now in force forbids smoking on cars of the elevated railroad and on closed cars on the surface lines, it being permitted only on the four rear seats of open cars with running boards. The hearing has been adjourned to Nov. 6, when the railroad companies expect to put in testimony.

Personal Mention

Mr. De Witt Smith, formerly of Meriden, Conn., has been appointed chief engineer of the plant of the Trenton & Mercer County Traction Corporation, Trenton, N. J.

Mr. William Irvin has resumed his position as superintendent of construction of the Bloomington & Normal Railway, Bloomington, Ill., after fifteen months' absence because of ill health.

Mr. Conrad H. Syme has been appointed general counsel for the Public Utilities Commission of the District of Columbia. Mr. Syme succeeds Mr. Edward H. Thomas, who has resigned to take up the practice of law.

Mr. Thomas Penney, who for the last five years has devoted himself largely to the executive affairs of the International Railway, Buffalo, N. Y., has resumed the active practice of law at the offices of Norton, Penney, Spring & Moore, Buffalo.

Mr. V. L. Edmunds has resigned as superintendent of transportation of the Binghamton (N. Y.) Railway to resume his duties as traveling representative with the Railway Audit & Inspection Company, with headquarters at its Philadelphia office.

Mr. E. C. Sherwood has been appointed general foreman of the De Kalb Avenue shop and carhouse of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y. Mr. Sherwood was formerly connected with the New York Railways as general foreman of the mechanical department.

Mr. Albert Akers, Quincy, Ill., has resigned as general manager for the Chicago, Peoria & Quincy Traction Company, Quincy, Ill. He will be succeeded by Mr. W. D. Chapman, Sr., of the Chapman Company, Chicago, Ill., which has the contract to build the road. Mr. Akers will retain his position as vice-president.

Mr. C. J. McCuaig has been appointed honorary lieutenant-colonel of the Fifty-third Regiment of Sherbrooke, Que. Mr. McCuaig is president of the Sherbrooke Railway & Power Company, a director of the Ottawa Light, Heat & Power Company and is interested in the Southern Canada Power Company, incorporated with a capital of \$3,000,000 to develop electrical enterprises in the eastern townships of Quebec.

Mr. A. F. Henry has been appointed assistant superintendent of the Buffalo-Lockport and Lockport-Olcott divisions of the International Railway at Lockport, N. Y., to succeed Mr. George Lamberts, resigned. Mr. Henry has been associated with the International Railway for twelve years and for three years was in charge of the Broadway carhouse in Buffalo. He was stationmaster at Lockport for nine years.

Mr. C. D. Garretson has been appointed a member of the City Public Utility Commission of Wilmington, Del., by Mayor Howell, succeeding Mr. Samuel G. Cleaver, resigned. Mr. Garretson is secretary-treasurer of the Electric Hose & Rubber Company and is first vice-president of the Chamber of Commerce of Wilmington. He is a native of York, Pa., and a graduate of Girard College, Philadelphia. He is thirty-two years old.

Mr. C. C. Burford has been appointed chief clerk of the Kankakee & Urbana Traction Company, Urbana, Ill., in charge of the advertising and publicity work for the company. Mr. Burford was formerly connected with Busey's Bank, Urbana, Ill. He studied at the University of Illinois and for four years has been correspondent of the Chicago *Banker*. He has also contributed articles on business and other subjects to many newspapers and journals.

Mr. John Kilgour, who has been president of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, for a long period, has resigned because of ill health and Mr. Bayard L. Kilgour, his son, has been elected in his stead to serve until the next meeting of the stockholders in May, 1914. Mr. Harry J. Gibson, first vice-president, who had tendered his resignation some weeks ago, has been succeeded by Mr. Charles Kilgour, second vice-president, and the position of second vice-president has been left vacant until the next meeting of the stockholders of the company.

Construction News

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

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

RECENT INCORPORATIONS

***Detroit, Almont & Northern Railway, Detroit, Mich.**—Incorporated in Michigan as a preliminary to the construction of an extension of the Detroit, Rochester, Romeo & Lake Orion line of the Detroit United Railway from Romeo to Almont, a distance of 188 miles. Capital stock, \$500,000. Directors: J. C. Hutchins, Joseph Bampton, F. W. Brooks, Irwin Fullerton and A. E. Peters, all associated with the Detroit United Railway.

***Ruhlman Railway, Youngstown, Ohio.**—Incorporated in Ohio in the interest of the Lake Erie & Youngstown Railroad to build a double-track line from Youngstown to Steubenville. John H. Ruhlman, incorporator.

FRANCHISES

Phoenix, Ariz.—The Salt Lake Valley Electric Railway has received a one-year extension of its franchise in Phoenix. This 20-mile line will connect Phoenix and Mesa. C. C. Lewis, president. [E. R. J., Oct. 25, '13.]

***San Francisco, Cal.**—Charles S. Swan, San Francisco, has asked the Board of Supervisors for a right-of-way for an elevated railroad which he says will be constructed according to his plans by a local corporation to be formed after the necessary rights have been obtained. This railroad is to be built for exposition passenger traffic from the ferry depot to the exposition grounds.

***Sausalito, Cal.**—W. W. Hicks and associates have asked the Council for a franchise in Sausalito. This is part of a plan to build an electric line from the reservation gates through the business section of Sausalito.

Morris, Ill.—The Fox & Illinois Union Railroad has received a fifty-year franchise from the Council to operate a railway in Morris. This 20-mile railway will connect Yorkville, Morris, Dwight and Sandwich. H. H. Evans, president. [E. R. J., July 5, '13.]

Muscatine, Ia.—The Muscatine-Davenport Railway, Davenport, has received a franchise from the Council for an extension on Front Street to the proposed site of its new freight depot in Muscatine.

Oswego, Kan.—The Kansas Central Traction Company, Topeka, has asked the Council for a franchise in Oswego. This line will connect Coffeyville and Parsons, via Edna and Altamont, with a branch from Altamont to Oswego. Philip Strack, Parsons, president. [E. R. J., Oct. 25, '13.]

Jefferson, Ohio.—The Chardon, Jefferson & Meadville Interurban Railroad has asked the Council for a franchise in Jefferson. The company has also asked the Councils in Chardon and the County Commissioners of Ashtabula and Geauga Counties for franchises. This is part of a plan to build a 30-mile line to connect Chardon, Hampton, Fontville, Rock Creek and Jefferson, Ohio, and Linesville, Pa. C. H. Felton, 735 Williamson Building, Cleveland, secretary. [E. R. J., Sept. 20, '13.]

Portland, Ore.—George F. Heusner, Portland, has received a franchise from the Council for a line from the Kenton district to the West Side business district in Portland. [E. R. J., Oct. 11, '13.]

Portland, Ore.—The Portland Railway, Light & Power Company has asked the City Commission for a franchise across the bridges over the Willamette River as follows: Hawthorne Avenue, Morrison Street, Burnside Street, Broadway and the bridge of the Oregon-Washington Railway & Navigation Company. The franchise, if granted, will permit the company to operate over the bridges named until 1932.

Chehalis, Wash.—The Washington Electric Company has asked the Commissioners of Lewis County for a franchise to use certain public roads in the southeastern and eastern part of Centralia. The company also asks for the privilege of using certain roads in southwest Centralia that will enable the Washington Electric Company to make physical connections with the proposed railway which the Chicago,

Milwaukee & St. Paul Railway is to build at once into Centralia and Chehalis. The date of hearing has been set for Nov. 17.

Tacoma, Wash.—The Seattle-Tacoma-Olympia Railway has asked the Council for a franchise from the east end of Lincoln Bridge easterly to the city limits of Tacoma. W. D. Hall, Seattle, president. [E. R. J., May 31, '13.]

***Wenatchee, Wash.**—The County Commissioners of Chelan County recently annulled the franchise granted to the Wenatchee Valley Railway & Power Company as it had failed to begin work on the proposed line when it had agreed to do so. Should the company secure the necessary funds, a new franchise will have to be obtained from the city of Wenatchee and the county of Chelan. Hyman Harris, Wenatchee, has petitioned for the same franchise recently held by the Wenatchee Valley Railway & Power Company.

TRACK AND ROADWAY

Arkansas Interurban Construction Company, Little Rock, Ark.—This company has authorized an issue of \$250,000 of 7 per cent bonds, which, added to the \$500,000 of paid-in capital stock, will be used as a fund to begin work on the proposed electric line between Little Rock and Hot Springs, Ark. The officers are as follows: W. H. Garanfio, president; Lewis Rhoton, first vice-president; W. S. Sorrels, second vice-president; M. B. Moore, treasurer; Louis Garrett, secretary-manager, and H. C. Couch, superintendent of construction. [E. R. J., Jan. 18, '13.]

Northern Electric Railway, Chico, Cal.—Right-of-way is being secured by this company for a line between Fairfield and Vallejo, the last section necessary to complete the line to Sacramento. A branch which will leave the Fairfield-Vallejo road at Napa Junction and extend north to Napa is also to be built at once.

***Denver, Col.**—E. W. Merritt, Denver, and associates are considering plans to build an electric line between Denver and its chain of mountain parks.

Georgia Railway & Electric Company, Atlanta, Ga.—Plans are being made by this company to build a 1-mile extension along Howells Mill Road in Atlanta.

Valdosta (Ga.) Street Railway.—During the next two months this company expects to rebuild 1 mile of track on North Patterson Street in Valdosta, taking up small rails and laying 70-lb. T-rails.

Idaho Falls (Idaho) Electric Railway.—It is reported that this company has disposed of bonds in the sum of \$1,500,000 and that the work of constructing 42 miles of railway, with a terminus in Idaho Falls and another at Blackfoot, will begin in the immediate future. The line will probably be completed and in operation by Nov. 1, 1914. J. L. Milner, Idaho Falls, president. [E. R. J., Oct. 23, '13.]

Quincy (Ill.) Street Railway.—Work has been begun by this company on an extension on South Fifth Street and a loop in Indian Mounds Park.

Kankakee & Urbana Traction Company, Urbana, Ill.—Grading has been begun by this company between Rantoul and Ludlow.

Lake Charles Railway, Light & Water Works Company, Lake Charles, La.—This company expects to build a concrete bridge over Pithon Coulee in connection with the city of Lake Charles. The city will award the contract. The company proposes to replace two crossings over railway tracks.

Worcester (Mass.) Consolidated Street Railway.—Double-tracking of Hamilton Street in Worcester will be begun by this company early next year.

***Detroit, Almont & Northern Railway, Detroit, Mich.**—This company, the incorporation of which is noted elsewhere in this issue, is understood to have acquired a private right-of-way for the section of the line between Romeo and Almont, 18 miles. J. C. Hutchinson is interested.

Detroit (Mich.) United Railway.—This company has been authorized by the Common Council of Detroit to begin construction of the Junction Avenue line, a four-mile double-track extension which was included in the recent settlement ordinance. This extension will serve as the beginning of

a belt line which will surround the business district of Detroit. It will connect all of the trunk lines radiating from the business district as well as a number of industries which, when the new extension is complete, may be served without transferring passengers through the business district. The work on this new extension will be begun at once, and a number of other extensions to the Detroit United Railway Company's lines will be built as soon as the Common Council authorizes the proposed lines now before it.

Minnesota Northwestern Electric Railway, Minneapolis, Minn.—Right-of-way is being secured by this company through Thief Falls, Germantown, North Silverton, Cloverleaf and Goodridge, and it is planned to begin construction on the first 25-mile section of the line this fall. Capital stock, \$500,000.—[E. R. J., Oct. 25, '13.]

St. Louis-Kansas City Electric Railway, St. Louis, Mo.—W. I. Allen, in charge of the plans for this railway, announces that the financing of the company is proceeding rapidly and that work will be taken up in the near future. This line will connect St. Louis and Kansas City, via Jackson, Lafayette, Saline, Howard, Boone, Callaway, Montgomery and St. Louis Counties. [E. R. J., Jan. 11, '13.]

***Ismay, Ekalaka & Southern Electric Railway & Power Company, Ismay, Mont.**—This company was recently organized to build an electric line in Ismay and the surrounding country. The following officers were elected: William Fulton, president; George J. Murphy, secretary and treasurer; M. H. Heldman, C. O. Wright, H. N. Sykes, M. L. Maxwell, W. H. Peck and John Oliver, executive committee.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—This company has been asked to consider plans to extend its East Side Hanscom Park line to South Omaha along Twenty-ninth Street, Dupont Street, Gold Street to Forty-second Street, and to connect with the L Street line in South Omaha.

***Reno, Nev.**—Plans are being considered to build an electric railway between Reno and Wellington. Ultimately it is planned to connect this line with the Copper Belt line at Wellington and extend it through Carson Valley, Minden, Gardnerville and Carson City. From Carson City the line will be extended directly to Reno. The power to operate this line is to be furnished by the Truckee River General Electric Company.

St. John (N. B.) Suburban Railway.—Plans are being considered by this company for an extension from Kane's Corner to Crouchville this fall or next spring and further extensions thereafter.

Exeter, Hampton & Amesbury Street Railway, Exeter, N. H.—During the next two weeks this company will award contracts to build a new siding between its carhouse and Hampton.

Frontier Electric Railway, Niagara Falls, N. Y.—Work on this company's three-track line between Buffalo and Niagara Falls will not be begun until the spring. Application for an extension of time on its franchise will soon be made. The line will connect Niagara Falls, Buffalo, Tonawanda and North Tonawanda. James S. Simmons, Niagara Falls, vice-president. [E. R. J., Aug. 23, '13.]

Syracuse & Suburban Railroad, Syracuse, N. Y.—This company is asked to consider plans for an extension from Syracuse to Oran.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—Financial arrangements are being made by this company to build its line between Chauncey and Athens.

Toledo & Western Railroad, Toledo, Ohio.—During the next month this company will award contracts to relay 1 mile of track with new 75-lb. A. S. C. E. rails and will rebuild three pile bridges and replace with steel bridge work on concrete abutments.

Lake Erie & Youngstown Railroad, Youngstown, Ohio.—Plans are being made to build a new double-track line south from Youngstown to Steubenville. About 10 miles of the roadbed on the Youngstown end has been completed. Work on the Conneaut end is to begin in the spring.

Berlin & Northern Railway, Berlin, Ont.—This company has let a contract for eliminating a curve on its old line and building a 1300-ft. culvert and abutments on an extension.

Dunnville, Wellandport & Beamsville Electric Railway, Wellandport, Ont.—Gainesboro Township has voted a large bonus to this company as an inducement to get the new line started which has been dormant since last season. Bonds are now being sold to provide funds to construct the Dunnville & St. Ann division of the line. [E. R. J., Oct. 4, '13.]

***Ortley, Ore.**—Cornelius Gardiner, Ortley, plans to build an electric tram line from Ortley to Rowena. The right-of-way has been purchased.

Portland, Ore.—An agreement was made recently between the Portland Railway, Light & Power Company and the Halsey Street Improvement Club by which the former will construct a line on Halsey Street from Sandy Boulevard east to the city limits, provided a bonus of \$21,000 is raised by the residents of this district. Property owners interested have subscribed \$16,000, leaving only \$5,000 additional to be raised.

West Side Electric Street Railway, Charleroi, Pa.—This company plans to build about 5 miles of extensions from Charleroi to Ellsworth. It has 3 miles in operation between Weaver and Ellsworth.

Hummelstown & Campbellstown Street Railway, Hershey, Pa.—This company plans to build early in the spring about 10 miles of new track from Hershey to Elizabethtown.

South Fork-Portage Railway, South Fork, Pa.—This company's line between South Fork and Portage is being completed by the Portage Construction Company.

Wilkes-Barre (Pa.) Railway.—Work has been begun by this company on a 3-mile extension to Askam, Warrior Run and the Eighth Ward of Nanticoke.

Jackson Railway & Light Company, Jackson, Tenn.—During the next few weeks this company will award contracts to build about 2 miles of new track in Jackson.

Austin (Tex.) Street Railway.—During the next few weeks this company expects to rebuild 1 mile of track in Austin.

Houston (Tex.) Electric Company.—Plans are being made to double-track and pave this company's line on Harrisburg Road in Houston.

Spokane & Inland Empire Railroad, Spokane, Wash.—James J. Keane, Moscow, representing citizens of Moscow, recently petitioned this company to extend its line to Colton and Uniontown and if possible to Genesee. A definite answer has not been given by the company, although, it is said, the officials have promised to give the matter careful consideration.

Tacoma, Wash.—Mayor Seymour was authorized by the Council recently to make an offer to the Tacoma Railway & Power Company to operate over Lincoln Bridge and the tide flats. It was tentatively agreed that the commissioners would offer a ten-year permit to operate across the bridge with the option of purchase of tracks by the city at any time after five years. The question of building a municipal line from the heart of the business district to the tide flats, the manufacturing section, is being considered seriously in Tacoma, and in all likelihood the matter will be settled, as regards the builder of the line, shortly. If the Tacoma Railway & Power Company cannot be induced to build it, the city will.

Sheboygan Railway & Electric Company, Sheboygan, Wis.—During the next eight weeks this company plans to purchase gravel-handling apparatus for its way department in Sheboygan.

SHOPS AND BUILDINGS

Fox & Illinois Union Railway, Aurora, Ill.—This company is now building a carhouse in Yorkville.

Kankakee & Urbana Traction Company, Urbana, Ill.—This company has awarded a contract to Sutherland & Sowers for the construction of a new carhouse.

Boston & Worcester Street Railway, Boston, Mass.—During the next six weeks this company expects to buy a wheel-boring machine, an air compressor and a milling machine.

Holyoke (Mass.) Street Railway.—This company has awarded a contract for the erection of a new 190-ft. x 400-ft. carhouse to the Caspar Ranger Company, Holyoke, at a price of about \$150,000. Plans for the building have been prepared by the Samuel M. Green Company, engineer, Springfield. The carhouse will front on Canal, Lyman, East and Bridge Streets, Holyoke, and will include general offices and a repair shop, the construction being of brick, concrete and steel. Work will be begun as soon as the company obtains a permit from the city to lay track into the property from the adjoining streets.

Exeter, Hampton & Amesbury Street Railway, Exeter, N. H.—During the next two weeks this company will award a contract to build a new carhouse in Hampton. The structure will be 50 ft. x 150 ft.

Niagara Gorge Railroad, Niagara Falls, N. Y.—During the next two months this company will award contracts to build two new carhouses in Niagara Falls.

Columbus, Delaware & Marion Railway, Columbus, Ohio.—Contracts have been awarded by this company for a new carhouse and repair shop.

Toronto & York Radial Railway, Toronto, Ont.—Plans are being made by this company to build an addition to its carhouses on Kingston Road in East Toronto.

Northwestern Pennsylvania Railways, Meadville, Pa.—Work has been begun by this company on its new passenger station in Edinboro. The structure will be of brick construction and will be built by the Constable Brothers, Edinboro. The cost of the station is estimated to be about \$10,000.

Jackson Railway & Light Company, Jackson, Tenn.—During the next few weeks this company proposes to award contracts to build an addition to its carhouse in Jackson.

Seattle (Wash.) Municipal Railway.—Bids are being received by this company to build a new carhouse and repair shop at Third Avenue West and West Ewing Street in Seattle.

POWER HOUSES AND SUBSTATIONS

Northern Illinois Electric Railway, Amboy, Ill.—Negotiations have been made by this company with the Illinois Utilities Company for the purchase of power.

Columbus, Delaware & Marion Railway, Columbus, Ohio.—Contracts have been awarded by this company for the erection of additional coal storage facilities at its Stratford power house. Contracts have been awarded by the company and construction is well under way for an auxiliary power plant at Marion, Ohio, to contain a 750-hp Curtiss turbo-generator, a Wheeler surface condenser, a Wheeler air pump and circulating pump, two 250-hp Heine boilers, a Worthington boiler feed pump, a Goulds motor-driven deep-well pump, a 6-ft. x 130-ft. steel smokestack and a 10-ton Case traveling crane.

Toledo Railways & Light Company, Toledo, Ohio.—This company is installing a General Electric 12,500-kw horizontal steam turbine with a Westinghouse-LeBlanc surface condenser. The company is also installing five Stirling boilers with a capacity of 3300 boiler hp and a 1000-kw rotary converter for the down-town lighting. A 1500-kw Westinghouse frequency changer has just been added.

Tennessee Railway, Light & Power Company, Memphis, Tenn.—The second hydroelectric plant of the Tennessee Power Company, the principal operating subsidiary of the Tennessee Railway, Light & Power Company, was placed in operation on Oct. 23. The construction of the plant was done by the J. G. White Engineering Corporation and, together with the first plant, will ultimately produce 68,000 hp. The present capacity of the new plant is 20,000 hp, and the current is transmitted over a high-tension line to Nashville, 150 miles distant.

Austin (Tex.) Street Railway.—During the next few weeks this company will purchase one 1000-kw unit complete for its power house in Austin.

Wisconsin Traction, Light, Heat & Power Company, La Crosse, Wis.—This company plans to build a new substation in La Crosse.

Manufactures and Supplies

ROLLING STOCK

Austin (Tex.) Electric Railway expects to purchase four closed cars.

Hull (Que.) Electric Company expects to purchase four double-truck car bodies.

Toledo & Western Railway, Toledo, Ohio, expects to purchase thirty 80,000-lb. capacity gondola cars.

Jackson Railway & Light Company, Jackson, Tenn., expects to purchase four steel one-man cars.

Northwestern Ohio Railway & Power Company, Toledo, Ohio, expects to purchase two new coaches in 1914.

Toledo Railways & Light Company, Toledo, Ohio, is building ten pay-as-you-enter cars in its own shops.

Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., expects to purchase two fourteen-bench open cars.

Northern Illinois Electric Railway Company, Chicago, Ill., is reported to be in the market for an electric locomotive.

Chicago (Ill.) Railways expects to purchase six sweepers. Fifty cars have been ordered from the St. Louis Car Company.

Tri-City Railway, Davenport, Ia., has purchased three new snow plows and sweepers to replace those destroyed by fire last winter.

New York State Railways, Rochester, N. Y., contemplates the purchase of new cars and will try out the new type of side-entrance, stepless cars before placing the next order.

Utah Light & Railway Company, Salt Lake City, Utah, has issued specifications for twenty-four semi-steel closed pay-as-you-enter cars, with seating capacity of fifty-six; length over body, 37 ft.; length over all, 50 ft. Eighteen of these cars are to be equipped with 40-hp motors and six with 60-hp motors.

Youngstown & Ohio River Railroad, Leetonia, Ohio, has ordered one 50-ton electric Baldwin-Westinghouse locomotive with 308-D-5 field-control motors and HL control. The electrical equipment will be designed for 600-volt d.c. operation and will produce a maximum drawbar pull of 25,000 lb. with a gear ratio of 16:57 and 36-in. drive wheels.

Montreal & Southern Counties Railway, Montreal, Que., expects to purchase about twelve new cars. These will be 57 ft. long, as against 50 ft. for the present cars and are designed to have through platforms. They will be of the multiple-unit, single-control type. Toilet accommodation will be provided. Baggage cars are also to be purchased.

Cincinnati (Ohio) Traction Company, reported in the ELECTRIC RAILWAY JOURNAL as having ordered fifty semi-convertible cars from the Cincinnati Car Company, has specified the following details for this equipment:

Bolster centers, length,	21 ft. 8 in.	Curtain fixtures.	Cur. Sup. Co.
Length of body.....	43 ft.	Curtain material...	Pantasote
Length over bumpers..	44 ft.	Heating system.	Peter Smith
Width over sills....	8 ft. 5/8 in.	Push button signal,	
Width over posts at		Registers	International
belt	8 ft. 1 3/4 in.	Roofs	turtle-back
Height from top of rail		Sash fixtures.....	Dayton
to sills	2 ft. 3/16 in.	Seats	longitudinal
Body	semi-steel	Seating material,	
Interior trim.....	mahogany	canvas lined hard enameled	
Underframe	steel	rattan	
Air brakes.....	West.	Step treads,	
Brakeshoes,		Mason carborundum	
combined brake shoe and		Trucks	Baldwin
head.		Varnish	Flood & Conklin
Bumpers..	5-in. steel channel	Wheels,	
Car trimmings.....	Dayton	chilled cast iron, 24-in. dia.	

TRADE NOTES

Standard Underground Cable Company, Pittsburgh, Pa., has issued a catalog describing its D. S. type indoor cable terminals.

F. C. Rose, assistant to E. N. Chilson, manager of purchases, J. G. White & Company, Inc., New York, and allied interests, has resigned to accept a position as general purchasing agent of the Foundation Company, Ltd., Montreal, Que. Mr. Rose will be located in the Ottawa Bank Building, Montreal.

Ewbank Electric Transmission Company, Portland, Ore., has been organized to develop a self-propelled car designed by H. B. Ewbank, Jr. This car uses an internal-combustion engine with electric drive and motors on the car axles. Some tests have been made with this car on the line of the Portland, Eugene & Eastern Railroad.

ADVERTISING LITERATURE

National Car Appliances Company, Spokane, Wash., has issued a folder describing its car wheel flange oiler.

Cooper Heater Company, Carlisle, Pa., has issued a folder describing its pressed-steel heater for city and interurban railways.

Whiting Foundry Equipment Company, Harvey, Ill., has issued a catalog describing the operation of its quick-detachable grab bucket.

American Engineering Company, Philadelphia, Pa., has issued a booklet entitled "What's the Matter?" in connection with Taylor stokers.

Sangamo Electric Company, Springfield, Ill., has issued Bulletin No. 36, describing and illustrating its ampere-hour meters for general service.

Field Omnibus Company, New York, N. Y., has issued two catalogs describing its electric buses operated by Edison storage battery and trolley buses for operating from a double trolley line.

Trussed Concrete Steel Company, Detroit, Mich., has issued the eleventh edition of its "Hy-Rib" handbook, describing in detail its new concrete reinforcement material, "Seven-Rib Hy-Rib."

Cincinnati Milling Company, Cincinnati, Ohio, has issued a catalog describing and illustrating its plain, universal and vertical milling machines, both cone-driven and high power with single pulley drive.

W. E. Belcher, Bloomfield, N. J., has issued a folder discussing the subject of transmission line protection and describing a new device for the attachment and support of the continuous ground wire. This clamp is manufactured by Hubbard & Company, Pittsburgh, Pa.

G. L. Simonds & Company, Chicago, Ill., have issued a catalog on the subject of economical steam production and the Vulcan system of soot cleaning as applied to all types of water tube and return tubular boilers. This system involves perfect distribution of the steam, so directed and controlled as to clean the entire surface of every tube.

The Street Railway Question in the Political Campaign in Cleveland

Notwithstanding the fact that the street railway question was supposed to have been removed from politics in Cleveland, it is often mentioned in the present campaign between Mayor Newton D. Baker and Harry L. Davis. It was hoped that they would omit all mention of the matter and allow street railway problems to be solved on the basis of facts and experience. Several motormen and conductors of the Cleveland Railway were suspended recently for violating a rule to the effect that they must not talk politics. The men were subsequently reinstated.

The two-transfer system has been put into effect so that a passenger may reach any part of the city on one fare. The old system called for two fares where a passenger boarded a car on a cross-town line, transferred to a main line and then to an east or west line.

Peter Witt, street railway commissioner, has suggested that the new bridge across the Cuyahoga River, between the East and West Sides, be so constructed that a connection may be made with a subway terminal in the center of the city for surface cars.

W. R. Hopkins, head of the Cleveland Underground Rapid Transit Company, states that his company will be ready to announce its plans in detail within a short time.