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A CURIOUS LEGISLATIVE PROPOSAL

A bill that is entitled to high rank among the curiosities, not to say the monstrosities, of legislation has been introduced in the New Jersey Legislature with the purpose of preventing railways from determining the exactness with which engineers observe track signals. The surprise test has long been an object of execration among careless railway employees. This fortunately small class of railway men have now induced a member of the New Jersey Legislature to introduce a bill providing that when tests are to be made in the operation of trains the railroad shall give previous notice in writing to the engineers! Only the type of legislator and labor man whose bias produces blindness to all considerations but one could fail to see the absurdity of a "surprise test" of which due notice was given in advance. Unfortunately legislation of the type here referred to is not always killed by its obviously preposterous character. Almost as bad as the New Jersey bill is the full-crew measure just signed by Governor Sulzer of New York in the face of the conclusive showing by the railways that the law will cost the carriers \$2,000,000 a year and accomplish no good whatever, the Public Service Commission having ample authority to order additions to train crews wherever it is shown that such augmentation is necessary. It is reported that Governor Sulzer, to secure the votes of the railway men, promised in advance of his election to sign a full-crew bill. If true, it makes this specimen of union-labeled legislation particularly vicious.

THE ARTICULATED CAR

The articulated car, some experimental results from which were published in our last issue, seems to have many points of usefulness. In order to secure economical operation a large car capacity, the largest which can be conveniently handled by the usual crew, is highly desirable, yet there has proved to be a serious practical

limit in increasing the car capacity owing to several important causes. First of these is the difficulty in working extra long and large cars around the curves which are found in most street railways. Second, there is the inaccessibility of the ordinary large car on the usual high trucks. Getting on or off becomes an operation troublesome to the passengers and productive of many delays. The articulated car seems to meet this situation very effectively when properly designed for low-entrance operation. The carrying capacity is large and is secured without loss in accessibility. It secures most of the practical advantages of a two-car train or a single car with a capacious trailer without the risks and inconveniences that attend these in ordinary city practice. The maximum length which can be given to an articulated car obviously depends on traffic conditions, but it will be readily demonstrated by experience, and unquestionably the carrying facility of the system, even if not worked to its extreme capacity by reason of short curves or other difficulties, appears to be exceptionally great. Whether the end doors are of real advantage in cars of this type may be considered somewhat dubious. They afford a small additional chance of egress at some risk in giving the conductor too many entrances to watch, and these, too, of differing kinds. We believe that this is a question depending largely upon the kind of traffic. If a car does a large amount of short-haul business, good exit facilities are much more important than if most of the passengers travel long distances. For the latter service the logical development would seem to be a car with closed ends permitting the maximum carrying capacity and entrance wholly via a low-entrance middle section. As an effort along these lines the articulated car is a very promising one and deserves to be thoroughly worked out in all its details. It is satisfactory to learn that the Boston system is planning to put a number of these cars in service.

UNIQUE FARE CONCESSION

The proposed plan by which the New York Railways Company and the city of New York, as owner of the municipal ferry to Staten Island, will unite to make a through 5-cent fare possible between Staten Island and uptown in Manhattan may give rise to some misunderstanding outside of New York. The details have not yet been settled, but the railway company and the ferry authorities have announced that such an arrangement will be made and that the ferry will receive 2 cents and the railway company will receive 3 cents instead of each receiving 5 cents as at present. The primary reason for the plan, so far as the city is concerned, is that, under the present subway scheme for the development of the city, Staten Island, which is a part of New York City, will receive no benefit, and as the city is subsidizing means of transportation to the north and east, the claims of its citizens to the south, it was thought,

should also have some recognition. The New York Railways is not directly concerned, of course, with this phase of the question, except as it forms part of the broad general proposition of rapid transit development in the entire city, and the company obviously could not make any reduction in its standard 5-cent fare for any considerable portion of its traffic. It so happens, however, that a great majority of those who would use this joint route are commuters whose offices are within a radius of a mile from the ferry, and it is believed that the length of the average railway ride which will be taken by passengers at this reduced fare will be considerably less than a mile. In fact, most of them now walk to their places of business. Viewed correctly and with a full understanding of the local conditions, it is one of the few places where a departure from the standard nickel fare might be possible, because the rate for most of this particular traffic would be more than 3 cents a mile. But the plan should not be considered as a precedent for a reduction elsewhere any more than the 2½-cent fare now charged for a ride over the Brooklyn Bridge is an argument for extending the same service over all of Brooklyn or all of Manhattan.

THE FLOODS OF LAST WEEK.

The floods which occurred last week all through the Central States, particularly in Indiana and Ohio, and even in a number of the Middle Atlantic States, are now fortunately subsiding. It is impossible yet to determine the actual loss of life and property, but while the earlier reports of both seem to have been exaggerated, it is probable that the disaster was the worst which has occurred from natural causes in the history of this country. While a great many of the details in connection with the flood are familiar to our readers through the accounts which have appeared in the daily papers, it has been thought that it would be of special interest to publish this week such information as was available in regard to the electric railway properties in the affected districts. It was not practicable to secure this information from every city in the flooded district or to record every instance of heroism or of the foresight and effort which were put forth to keep cars running as far as possible and to minimize the loss of life and to electric railway property. Nevertheless, the history of the flood, if it could be written in detail, would supply many such instances. The properties most affected in the Central States are but just emerging from the disaster which has overtaken them and the territories which they serve, but the work of rehabilitation has already been begun and will be continued and completed, we are confident, with the same courage and energy which marked the original construction and promotion of these lines.

The broad question of the best means to adopt so as to avoid a similar disaster in the future is still to be considered. It will undoubtedly be solved by the engineering profession. A note of warning is sounded in this week's issue of the *Engineering Record*, however, in regard to quick judgment upon this matter. The *Record* says: "Reservoirs, levees, by-passes—all have been carefully studied, but whether one or another or a combination is desirable for a particular watershed and stream is not a subject for snap

judgment. The factors involved are too many and too variable to generalize. While, therefore, engineers can concur in the general proposition that measures to stop, or to minimize, the floods are advisable, commitment to any particular means without careful investigation would indeed be imprudent." It is impossible to conceive that the general question of protection against floods of this kind is beyond human ability, even with an exceptional rainfall of 6 in. or more during five days, such as occurred in Indianapolis and other places in the flooded district. The lesson has been a very costly one, and the solution of the problem should at once be attempted.

THE ARRIVAL OF THE BUS-VERSUS-TRAM CONTROVERSY

In the past few years occasional comment has been made in these columns upon the so-called "bus-versus-tram controversy" which has been raging in Europe without the least sign of weakening as it gains in age. In fact, the seriousness with which the more enthusiastic adherents of the automobile bus regard its ability to replace the trolley car for congested city traffic has been exemplified by actual expressions of doubt as to the wisdom of the recent extensions to the street railway system of Paris in preference to the use of the cheaper but less efficient self-propelled vehicle. Apparently this controversy has at last been projected into the United States, for strong opposition by a number of railway officials developed at a public hearing on Wednesday against some proposed legislation designed presumably to permit bus competition with the existing street railway lines of New York City.

That the impending competition would really follow the passage of the necessary enabling legislation seems quite likely, in view of the public announcement of the backers of the proposed bus line. Yet the financial success of such a project is extremely problematical. The limited use of the automobile bus in this country does not provide an opportunity for exact cost comparisons with the trolley car, but from such figures as are available, it appears inconceivable that a bus line can fairly compete with the electric railway in city service.

It is of course quite possible that under special privileges the bus will thrive. Such a condition exists in London where an area roughly 3 miles in diameter, on account of its narrow, crooked streets, is served only by buses. As this is the business district of the city with an all-day, short-haul traffic, it is rightly called the "bus paradise," and with such a profitable district as a basis, it is easy to see how Londoners can fall into the error of assuming that their trolley cars, whose traffic is strictly limited to the less profitable service and which are handicapped by a high capital charge, could not compete with the buses.

For a fair comparison competition must be upon a reasonably even basis. The costly pavements which make the operation of the bus a commercial possibility enable it to escape the heavy interest charge which the electric railway pays for its tracks, and as the bus is notoriously hard upon paving, any community which does not impose a tax sufficient to cover the item is simply transferring its money from one pocket to another if it seeks to receive cheap or

frequent bus service at the expense of its streets. In England an attempt to equalize this is made by the imposition of a road tax of 3 cents per gallon on gasoline, amounting to about 0.4 cent per bus mile. Yet evidence has been adduced to show that this is insufficient.

In New York City the surface lines are handicapped by the heavy fixed charges involved by the underground trolley system originally imposed by the city, and the bus is favored by very generally smooth pavements. If the bus can be made to compete for city traffic in this country, New York is manifestly the place for it, and if it can be proved to be better for the public and more profitable to its owners than the electric car any legislation which arbitrarily prevents its use is the height of absurdity. This does not mean the advocacy of unrestricted competition. Nothing could be less desirable. Unless the bus can be clearly shown to be capable of supplying something which the electric railway cannot, its entrance into the field could only produce financial loss and, in the end, lessened facilities for the public. Still, New York is so fortunate as to have a Public Service Commission which has already established precedents against the inception of such chaotic conditions, and it is certain that the bus will have to demonstrate a *raison d'être* before its use is extended very far.

SIXTY-CYCLE CONVERTERS IN CLEVELAND

The arrangements for power supply of the Cleveland Railway Company described elsewhere in this issue are typical of the present apparent tendency toward the use of purchased power. The railway company has arranged for the use of sixty-cycle current purchased from the local lighting company and, as a means to that end, has installed, in its various substations throughout the city, specially designed sixty-cycle rotary converters having capacities of 1500 kw. As mentioned before in these columns, the use of large sixty-cycle converters became practicable only with the development of the commutating pole because this has largely eliminated the influence of fluctuations in the d.c. load and the consequent difficulties in commutation.

At Cleveland the effect of steady-running steam turbines which supply the power is believed to have a considerable influence on the successful operation of the new rotaries through their ability to produce electric current at constant frequency, thus relieving the designers of any necessity for protection against disturbances on the a.c. side of the converters. Undoubtedly the success of the new design is also due in part to the high speed employed and to the great mass of the armature. The mechanical effect of the momentum thus set up enables the converter to pull through momentary overloads without hunting.

As the designers have kept a reasonable proportion of the mass of the machine in the moving parts, the heat losses are thereby minimized. The magnetic circuit also tends to respond very rapidly to the demand for reversing flux. While the machines have been in service but a few months, experience with them during that time has amply demonstrated that flashing over can be practically eliminated in high-frequency rotaries and that sixty-cycle machines of large size may be installed without any fear that the difficulties of design have not been overcome.

CHICAGO WAGE ARBITRATION

The arbitration to settle the question of the wages of the street railway employees in Chicago was concluded last Saturday, and under the new schedule the majority of the men will receive an increase of 2 cents an hour. The decision of the majority of the board does not exactly suit either side, but both have agreed to accept it. It is unfortunate that a unanimous decision was not reached by the arbitrators, but this is hardly to be expected in any board composed of one representative from each side to the dispute under consideration and one neutral arbitrator. The representatives chosen on behalf of the opposing sides must be arbitrators in name only. Practically they are the counsel for their respective sides and are expected to urge the claims of the side they are representing during the hearing and to secure for it as much as they can. Hence, when a decision is reached by the neutral arbitrator, or he decides upon a compromise which is accepted by one of the partisan arbitrators, the other is almost bound to dissent and submit a minority report. Otherwise he will seem to those whose interests he is representing not to have been sufficiently active and aggressive in their defence.

As we have said before, if an arbitration board is to be made up with one-third of the members to represent one side, one-third the other side and one-third to be neutral, we believe that it would be much better to have the board composed of six members rather than three. With six members there would be two to represent each interest, and one would be able to give moral support to the other in the acceptance of compromises or of conclusions which have been found during the hearing to be fair but might be considered disadvantageous to some of those concerned in the dispute.

In this connection it is interesting to note that the Railway Business Association is advocating the passage of an amendment to the Erdman arbitration act at the present extra session of Congress. One of the reasons urged in favor of this action is that the present law provides for but three arbitrators, two of whom are partisans. It is believed that an increase in the number of neutral arbitrators would bring more minds to bear upon the questions arising and would tend to promote equity in the decisions. The Railway Business Association also urges a longer period for the investigation, which is now limited to thirty days, that the act should be made more generally applicable to railway employees and that the qualifications for arbitrators should be enlarged so as to make a larger number of individuals eligible.

The opinion expressed by the majority of the Chicago board upon the cost of living is a clear discussion of the situation, which is really very simple but is often misunderstood. The claim of the trainmen was that their pay under the old schedule was not adequate to cover the actual cost of living as it prevails under the present-day conditions in Chicago, and detailed statistics were presented to justify this claim. The opinion of the board is that the question under consideration by it was not what constituted a "living" wage for the Chicago trainmen but what was a "fair" wage for them. It was impracticable, the board said, for it to decide what was a living wage, because no two

authorities would agree upon this point. An income that would be sufficient for one family would be inadequate for another of equal size. Again, according to the board, if the actual cost of living was the only standard for wages, then all wage earners would receive the same amount, and the wages which would be paid to trainmen, with the skill and responsibility which go with their positions, would be the same as those received by lower priced labor, of which there is, of course, a great deal in Chicago, even on the railway systems.

We agree with this view. A great deal is being said today about the desirability of establishing a "minimum" wage for the very lowest paid of industrial employees, like shop girls. Economists differ as to the practical effect upon the workers at large of an attempt to establish and enforce a minimum wage of this kind. But whether such a plan would be desirable or not, it hardly concerns the skilled industries, like railway operation, where the criterion of the adequacy of the wages paid is the wages which will secure and retain in the industry employees having the skill necessary to perform the work required, and by wages in this connection we mean also the conditions surrounding the work and the permanency of the employment. For these reasons the percentage of men who leave the service of an electric railway company during the year is a better standard by which to judge whether the wages are adequate than theoretical discussions whether any given sum constitutes a living wage or is adequate for a certain specified standard of living.

EQUIPMENT TROUBLES WITH LONG TRAINS

Reference was made in these columns in the issue of Dec. 28, 1912, to the trouble experienced in burning shoe fuses on the end cars of long trains due to the shunting effect of the bus line in parallel with the third rail. There are other equipment troubles that can be directly attributed to the length of the train or troubles that are very much increased from this cause. A familiar example is the application of brakes on the head cars of long trains before the other cars are affected. This has been overcome by the development of the electro-pneumatic system, which permits the brakes throughout the train to be set before the slack has a chance to run ahead.

Another source of trouble on electrically operated trains has been the drop in potential in the control train line. As this line is one of low voltage, a poor contact in the receptacles or between the jumpers and receptacles causes a considerable drop in voltage, and this in turn causes sluggish operation of the control switches. The uneven acceleration of the different cars in the train which results from this action is not only a source of discomfort to passengers but leads to excessive drawbar strains as well, and manufacturers are now providing jumpers and receptacles with spring contacts and spring points.

The inability of motormen to reset the line switches from the cab after these have been blown on overload has been another source of trouble. All reset coils for the line switches on different cars are generally connected in parallel, and when the reset wire is energized the current passes through all coils whether the line switches are

blown or not. With long trains the current taken by these coils sometimes reduces the available voltage to such an extent that the current which passes through the coil on the blown line switch is insufficient to reset it. With heavy traffic the additional load thrown on other motor cars by the blowing of a line switch has caused others to blow and stall the train. It is then necessary to reset each line switch by hand before the train can proceed. To overcome this on one system, the connections have been changed so that current will pass only through the reset coil of the line switch which is open. This change, together with the adjustment of line switches on inspection so that they can be reset with about three-quarters of the normal voltage, has eliminated the trouble almost entirely.

MEMBERSHIP IN TERRITORIAL ASSOCIATIONS

In the *ELECTRIC RAILWAY JOURNAL* for March 1 the attention of non-member companies throughout the country was directed to the advantages and low costs of membership in the American Electric Railway Association. It is equally pertinent to point out that this participation in the affairs of the national body of electric railway interests should be supplemented by membership in state or other territorial associations. It is erroneous to assume that membership in one kind of association makes it unnecessary to belong to the other kind, for each society has a field of its own. The great technical and economical questions of the industry, including those which affect interstate commerce, are best handled by a nation-wide organization, whereas a state or sectional organization is the proper medium for the interchange of information on local problems. The constant growth in the number and scope of state utility commissions, however, is a later and most logical reason for the united action of the railways which come under their control. The very law of self-preservation should impel the electric railways of each state to fix upon common policies if they desire to enjoy the respect of the men whom the state has appointed with powers to make or break them.

The recent hearings on block signal installations held before the Indiana Railroad Commission showed clearly the necessity for the united action of the railways concerned, and this united action was fostered by the fact that the railway managements had already become well acquainted with one another through the Central Electric Railway Association. Again, the average public service commissioner does not come into office as a railroad expert, and his just understanding of conditions will be greatly retarded to the injury of the railways if he or his delegates are not brought into touch with the railway representatives as a whole. Without doubt the electric railways which are under the jurisdiction of the New York Public Service Commission, Second District, have saved a great deal of money and gained much good will by the fact that members or representatives of the commission have been frequent attendants at the quarterly meetings of the association. At these meetings they can expound their views on the subjects under discussion and also enjoy the opportunity of seeing from the very nature of the proceedings how earnestly the railways are trying to increase their usefulness to the public.

If an association can accomplish such results when it represents only part of the railway interests of its state, it is obvious that its field of usefulness will be far greater if it can appear as the spokesman of all or practically all the electric railways within its territory.

PLANING MILL EXHAUSTER SYSTEMS

A fact which does not seem to be generally realized in planning a shop is that the wood mill should be located as near as possible to the shop power house. The reason for this is that the shavings exhaust system which is almost invariably installed in the planing mill to care for the sawdust and other refuse made by the woodworking machines becomes the most uneconomical method of transporting this refuse when the distances are excessive. The power required to handle shavings for a distance of 400 ft. or 500 ft. is all out of proportion to the value of the service rendered. In fact, a planing mill should not be installed more than 150 ft. away from the point at which the refuse is to be destroyed.

It is, of course, possible, as is done in some cases, to discharge the shavings into a special burner located 50 ft. or more from the wood mill and thus destroy them without transporting them to the boiler house. On the other hand, this procedure involves expense for attendance and the shavings have a certain heat value which, especially in winter time, is worthy of consideration from the standpoint of economy.

The reason for the inability of a shavings exhaust system to handle material for long distances is that the velocity of the air in the shaving ducts must be maintained at a high figure. Otherwise the shavings will be dropped out of the moving current of air and deposited in the bottom of the duct, thus choking it up. A velocity of 3000 ft. per minute is about the lowest which can be successfully used, and at times of heavy load this, of course, has to be increased. The result of the high velocity is that the skin friction of the duct becomes such an important item that when great lengths of duct are used the pressure required to force the air through it is relatively enormous.

This is one of the prime causes why so many exhaust systems fail to operate satisfactorily after installation. A common method of designing such plants is to put in a single fan which is only capable of exerting a total pressure equivalent to about 10 in. of water. On the suction side of the fan about 6 in. or 7 in. of this pressure is necessary to draw shavings into the ducts of the machines and into the floor sweeps of the floor of the mill. The remainder, or say a 3-in. water column, is available for transporting the shavings between the fan and the shop boilers where they are generally burned. If the distance is excessive the proportion of the total pressure difference which is used upon the discharge side of the fan will subtract so much from the pressure available for suction on the suction side that the system will hardly operate at all.

The difficulty is sometimes overcome by using two fans and two separators, the second fan and separator being installed on the roof of the building containing the shop boilers; but such an arrangement involves an expenditure of power so great that it is a grave question whether the

saving in labor added to the fuel value of the shavings warrants this step.

INTERURBAN ROADS IN THE NEW INDIANA LAW

The effect of the new public utility commission law of Indiana is to class interurban lines as "public utilities" and to subject them to a degree of state regulation from which the steam railroads are relieved. The railroad law is continued in force so far as the steam railroads are concerned; the interurban lines, on the other hand, are no longer to be under the mild form of regulation which it prescribes, but are to be under the control, as to service, rates, securities and valuation, of the thorough-going law which becomes effective May 1. The discrimination in the policy of the State as between electric interurban roads and steam roads is exercised in spite of the argument of the representatives of the interurban lines that the two classes of properties are competitors and that the electrically operated properties should not be placed at a disadvantage as compared with the steam properties. The plea of the interurban roads was disregarded, however, so that the conditions under which the properties must be operated are those of the new law, an abstract of which was published in our issue of March 15.

The statement that the interurban lines are competitors of the steam roads is, of course, a fact. It is not all of the truth pertaining to the competitive relations of the properties, however. The interurban lines have taken business from the older properties, but they have also developed business which the steam roads were not equipped to handle and did not cater to successfully. If the interurban lines have not built up more business from undeveloped sources of traffic than they have taken from the steam roads, if they have not provided service, convenience, facilities and comfort that the older properties have not provided, they have not filled their proper place. These conditions, however, have been worked out by interurban lines in localities where there is direct competition with the steam roads, where rates are nearly equal or are a little lower on the electric property, but where the electric line has more trains per day, better terminal facilities and prompter delivery of packages. While the Indiana electric lines were freed from any regulation which seriously hampered their development by these methods, the steam lines were just as free to meet and overcome the competition if they could do so.

The fact that the conditions as to state regulation are to be changed raises the question of how the State, to be equally fair to each interest so far as the law permits, will adjudicate the questions which will arise. Certainly it cannot afford to use powers conferred by a strong law to the detriment of the interurban properties and to use the powers of the old law so that a preferential advantage to the competitors of these properties will result. The duty of the new commission will be to follow the course laid down in the letter of the law, but to do all that it can to protect the various classes of property interests with justice to each. The serious problems that are laid before the commission by the potential complication in the language of the statute should be handled in that spirit of wise regulation which seeks to conserve and upbuild utilities as well as to protect the public interest.

Electric Power in Cleveland

The Cleveland Railway Company Has Abandoned a Large Part of Its Power-Generating Equipment and Is Purchasing from the Local Lighting Company 60-Cycle Current Which Is Converted to Direct Current in a System of Modern Substations with Storage Batteries—An Account of the Installation Is Given Together with a Description of the 60-Cycle, 1500-Kw Rotary Converters

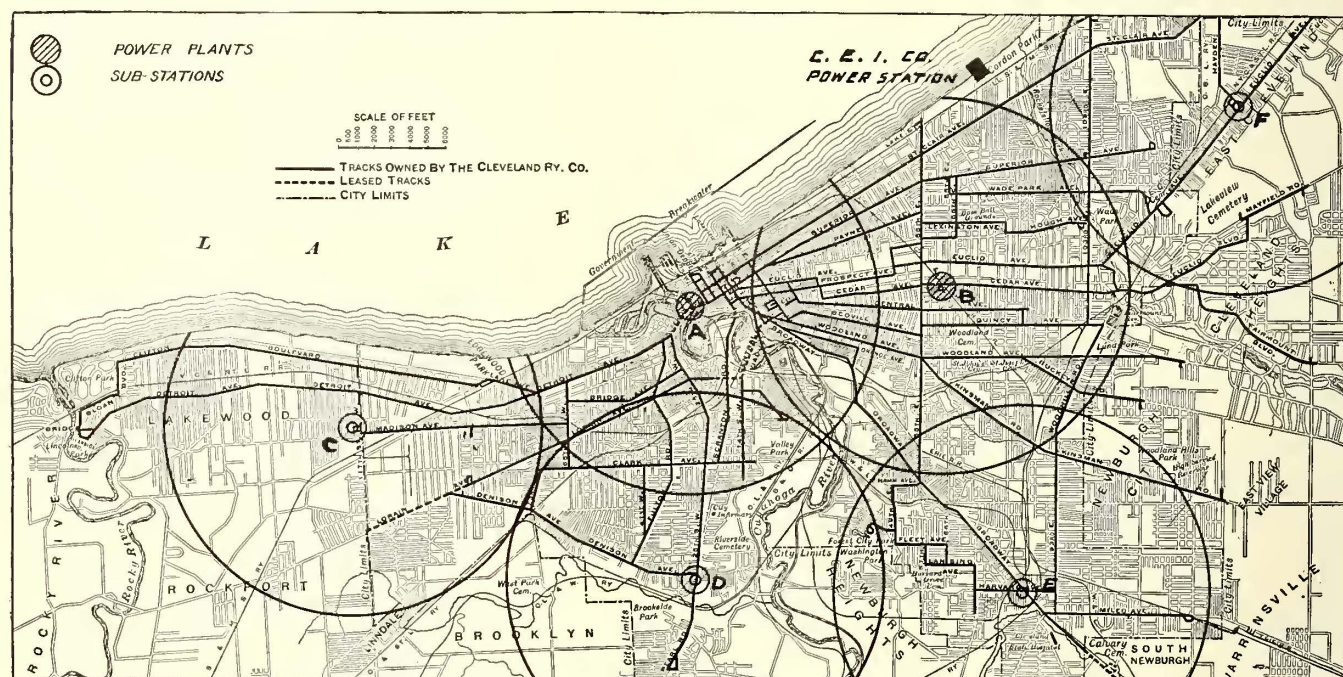
For the past few months the Cleveland Railway Company has been drawing power in increasing quantity from the stations of the Cleveland Electric Illuminating Company under the contract described in the issue of the *ELECTRIC RAILWAY JOURNAL* for April 20, 1912, page 664. The contract went into effect Nov. 15, 1912, but at that date the railway company had but one substation in operation. The date at which the minimum-power clause of the contract becomes operative was, therefore, advanced to May 15, 1913.

POWER HOUSE AND SUBSTATION DISTRIBUTION

The plan of power house and substation location for the electric railway is shown in the accompanying chart. The zones are 4 miles in diameter and each one is normally

built twenty-six years ago and containing ten 62-kw and two 125-kw bipolar generators belted to Ball engines. This was shut down last November. The Division Street plant, which will be abandoned in a few weeks, is equipped with one Wetherill and two Allis-Chalmers Corliss condensing engines having a total capacity of 3900 hp. The engines are supplied with steam by a battery of four Heine and four O'Brien water-tube boilers, all equipped with Roney stokers. Both the Viaduct and the Cedar Avenue plants consist of two parts, one obsolete, the other fairly modern. Both of the modern parts will be continued in service.

The newer engines in the Viaduct station have a combined capacity of 9600 hp and are of the horizontal cross-compound, Corliss condensing type, three Allis-Chalmers



Cleveland Power—Distributing Areas Around Power Plants and Substations

supplied from a single station. The points marked "A" and "B" are respectively the Viaduct and the Cedar Avenue d.c. steam power stations, which are located in the downtown district. The former station was originally operated by the Cleveland City Railway Company and the latter by the Cleveland Electric Railway Company. The four substations shown are, from west to east, Contant Avenue, West Twenty-fifth Street, Harvard Avenue and Windermere. Of these the fourth was put into operation on Nov. 15, 1912, and the third two months later. The others will be completed in a few weeks. These substations are all equipped with 60-cycle rotary converters and draw 11,000-volt, three-phase power, principally from the recently constructed Seventieth Street power station of the Cleveland Electric Illuminating Company.

PRESENT AND FORMER STEAM PLANTS

Before the completion of the Windermere substation all power generated for railway purposes in Cleveland was in d.c. form. This was produced in four power plants inherited from the companies which united to form the Cleveland Railway Company. The oldest was the Canal Road station,

and one Cooper. All are direct-connected to General Electric and Westinghouse d.c. generators. There are ten Stirling boilers equipped with chain-grate stokers and these have a combined capacity of 5792 boiler-hp. The modern part of the Cedar Avenue plant contains two horizontal and two vertical cross-compound Corliss engines with a total capacity of 12,000 hp. They are supplied with steam by ten B. & W. boilers and eighteen Stirling boilers. The engines are direct-connected to General Electric d.c. generators. All of the plants contain the auxiliaries usual in the best type of stations built about ten years ago.

BATTERY HOUSES AND BATTERIES

In connection with the original d.c. plants five storage battery stations were employed. At Cedar Avenue there was a 2400-amp battery containing 288 cells of the G-65 type made by the Electric Storage Battery Company. This will now be removed and the plates incorporated with those of other batteries. The Harvard Avenue and Windermere substations were formerly battery stations only: The former contained a 2300-amp, 219-cell G-59 battery and the latter a 1600-amp, 264-cell G-41 battery. At the Har-

vard station the battery will remain as before except that cells from the Cedar Avenue battery will be added to raise the voltage to 600. At Windermere an entirely new battery has been installed and is operating in parallel with the rotary substation. The new battery has 290 cells of R-25 plates with a capacity of 1440 amp-hr.

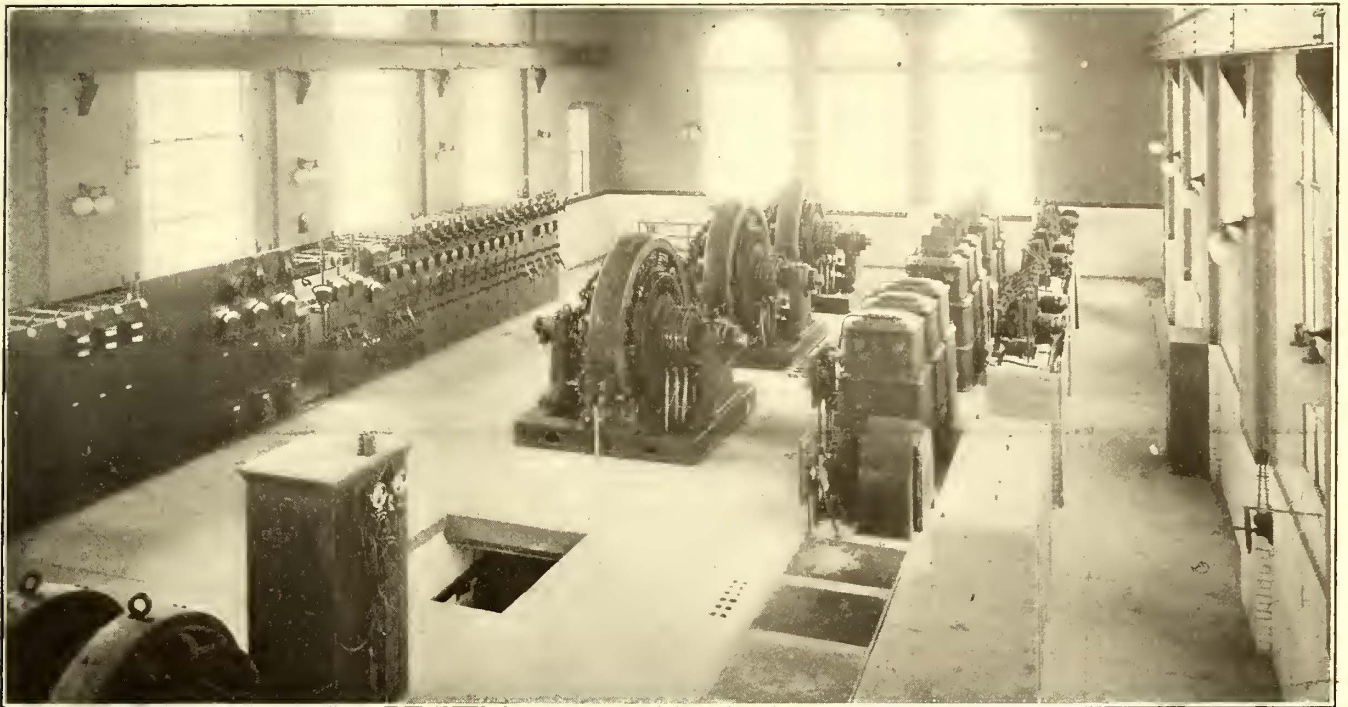
The Detroit Avenue battery is located about a mile east of the Contant Avenue substation. It originally contained a 1600-amp battery of 252 cells. This number will be increased to 290 by the addition of cells from Cedar Avenue as at the Harvard substation. This battery will be operated from the Contant Avenue substation where the booster, switchboard, etc., will be located. It will be connected with the station by two 1,000,000-circ. mil. cables. A pilot cell in the substation, located in an isolated basement room, will be connected in series with those in the battery house. This is for hydrometer measurements, which are to be made every hour. By this simple expedient skilled attendance in the battery house is rendered unnecessary. The West Forty-fifth Street battery is located somewhat more than a mile southwest of the Viaduct power house. It contains 262 cells of R-25 plates with 1440 amp-hr. capacity.

smaller machines which are adjusted carefully to the load curves. Smaller units work in here to better advantage. They are the new type, exactly similar to the larger units, at the other stations.

THE WINDERMERE SUBSTATION

The Windermere substation is typical of all the others. General views of its interior as well as the details of the layout are shown in the accompanying illustrations. The building, like those housing the other substations, was designed in the power department of the company, after an exhaustive study of the best practice throughout the country. In addition to the electrical equipment described below it contains an electrically operated crane and an air compressor for use in cleaning machinery and other auxiliaries. This, while not absolutely necessary, conduces to convenience and cleanliness. The general layout shown on page 620 will serve as a basis for the following explanation, and this when examined in connection with the interior photographs gives an accurate idea of the arrangement of the equipment.

At the top of the plan are shown at the left the auxiliary battery and lighting panels and in the center the main



Cleveland Power—Interior View of Windermere Substation Showing Switchboard and Converters

It will be removed to the West Twenty-fifth Street substation in the near future and twenty-eight cells from Cedar Avenue will be added.

All of the batteries are furnished with booster sets consisting of 600-volt motors and generators capable of boosting the voltage at least 50 volts, and with sufficient capacity to carry any current which the batteries may give out. All boosters, instruments and control equipment will be in the substations, suitable battery switchboard panels having been provided.

SUBSTATION EQUIPMENT

The new substations will contain the following equipments:

Substation	Number of Rotaries Present	Number of Rotaries Ultimate	Size of Rotaries, kw	Total Ultimate Capacity, kw	Remarks
Windermere	4	5	1500	7500	Fourth rotary now being installed
Harvard Avenue	3	5	1500	7500	
Contant Avenue	2	4	1500	6000	Under construction
West 25th Street	2	4	1000	4000	Under construction

At the West Twenty-fifth station the demand is for

switchboard. Details of these are given in other figures. Rotaries No. 1, No. 2 and No. 3 are now in operation and No. 4 is being installed in the space marked "future." On the site of future rotary No. 5 is now located a 250-kw series feeder booster, with a range from 0 volt to 250 volts. This is driven by a 600-volt d.c. motor.

The battery booster, shown at the left, is of 112-kw capacity and produces about 175 volts. It is driven by a 170-hp, 600-volt motor at a speed of 520 r.p.m. Between the two boosters is the exciter set for the battery booster. The field of this is controlled by a carbon-pile battery regulator, the armature terminals of the exciter being connected directly to the booster generator field terminals. The connections are shown in the accompanying wiring diagram. To the right of the auxiliary battery and lighting panels is a 50-kw motor-generator battery-charging set.

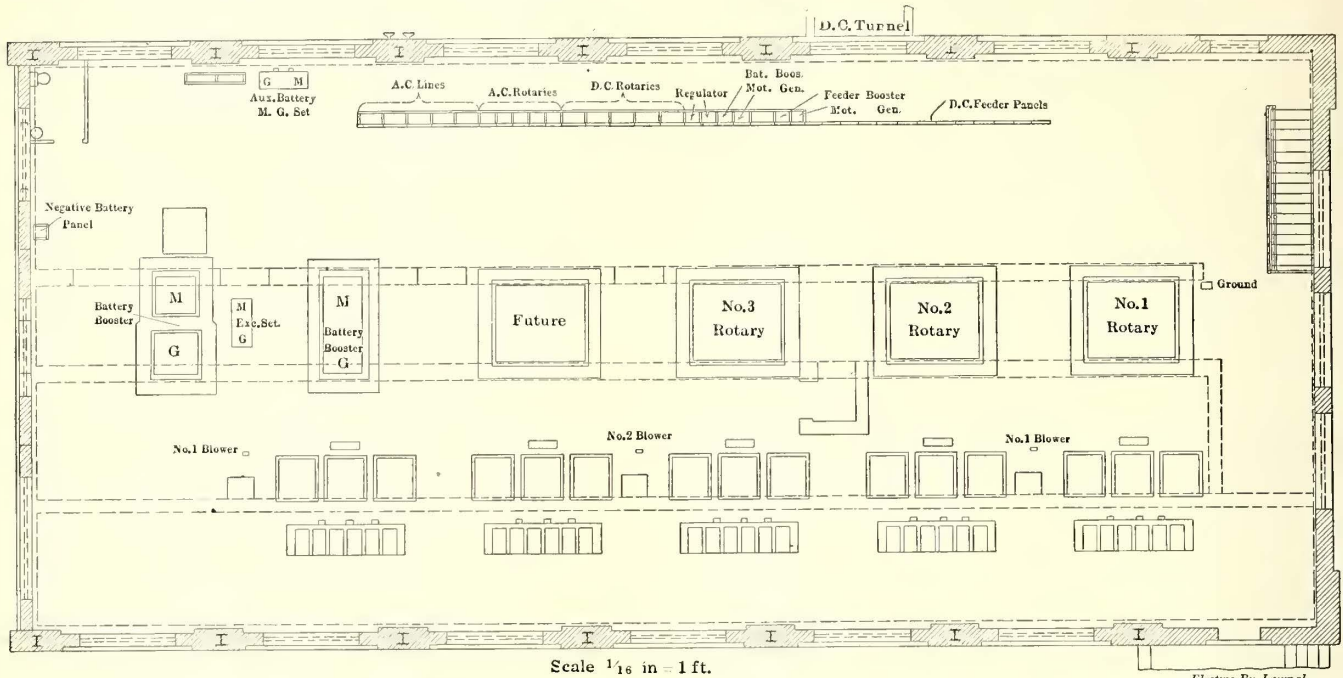
TRANSFORMERS

The banks of 550-kva delta-connected, air-blast transformers are shown on the layout below the rotaries. These have 6 per cent reactance and an additional 2 per cent is provided by the natural reactance of the leads. Taps are brought out

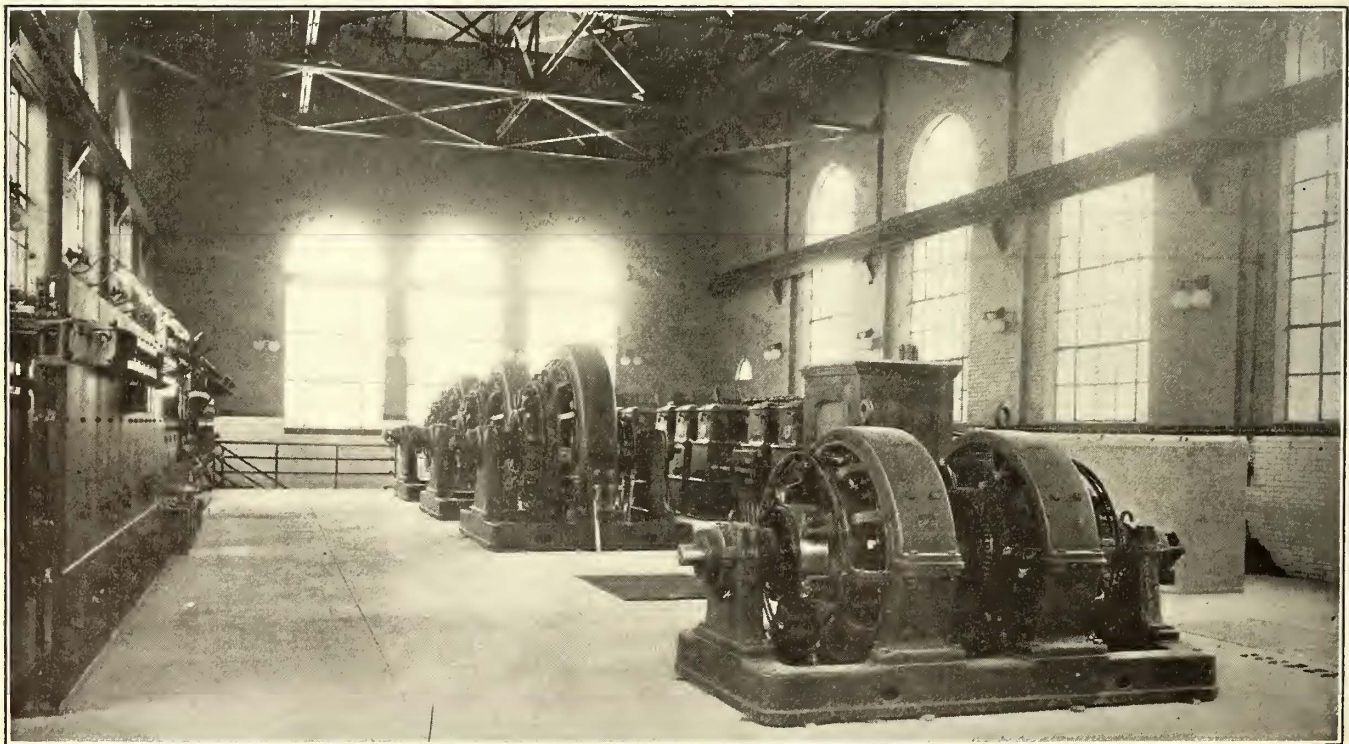
for a.c. starting, giving one-third, two-thirds and full voltage on the low-tension side. The starting panel is shown above the center transformer of each bank. The fans are placed to the left of the first and third banks and provision for a third is made to the left of the fifth bank. Near each blower is a control panel through which current can be supplied from the 1-3-5 taps of either of two rotaries, the

switches are of the GE, F-13 type and are designed for 300 amp and 15,000 volts. The bus chamber is about 9 ft. wide and 9 ft. high with one side devoted to the busbars and the other to incoming lines. On the ceiling are wattmeter and relay current transformers.

The bus compartments are placed one above the other on the floor and arranged for sectionalizing the buses. This



Cleveland Power—Plan of Windermere Substation



Cleveland Power—Interior View of Windermere Substation Showing Battery Booster Set

armatures of which are diametrically connected. The fans have 20,000 cu. ft. per minute capacity at $\frac{3}{4}$ -oz. pressure and are driven by 15-hp squirrel-cage three-phase motors.

HIGH-TENSION SWITCHING APPARATUS

The high-tension switches are in fireproof compartments on the main floor behind the transformers and the bus chambers are directly below them in the basement. The

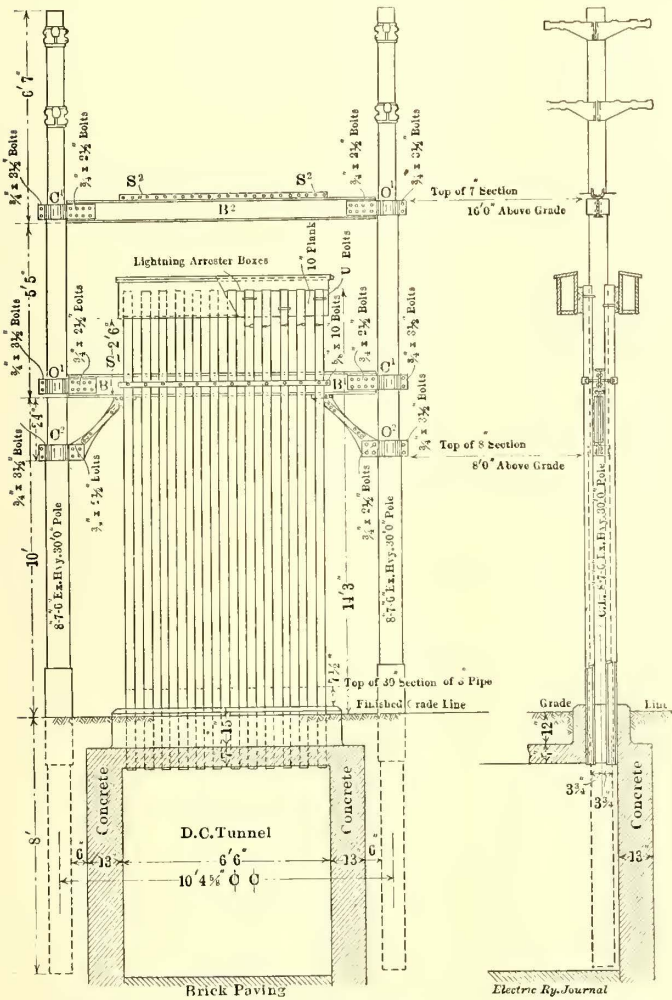
is important because at present all substations are operated with open lines, the rotary and line buses being sectionalized to prevent the destructive effects of short-circuits. The vertical partitions are of brick and the horizontal ones of reinforced concrete set into recesses in the walls.

The buses are of flat copper 2 in. x $\frac{1}{4}$ in. in section. They are supported on pin porcelain insulators. All appa-

ratus in the chambers is mounted upon angle irons set in the brick partition walls. The instrument wiring in the bus chambers is concealed in iron conduits molded in the concrete slabs.

MAIN SWITCHBOARD

The main switchboard is shown in elevation in one of the illustrations and diagrammatically in plan on the general layout. As indicated in these, beginning at the left, there are two future and three present a.c. line panels, two future and three present a.c. rotary panels, two future and three present d.c. rotary panels, two battery regulator and two booster panels, one total d.c. load panel, two feeder booster panels and fifteen outgoing d.c. feeder panels. At the top of each a.c. line panel a voltmeter and an ammeter are located. Below these are a polyphase indicating wattmeter, a power-factor indicator and watt-hour



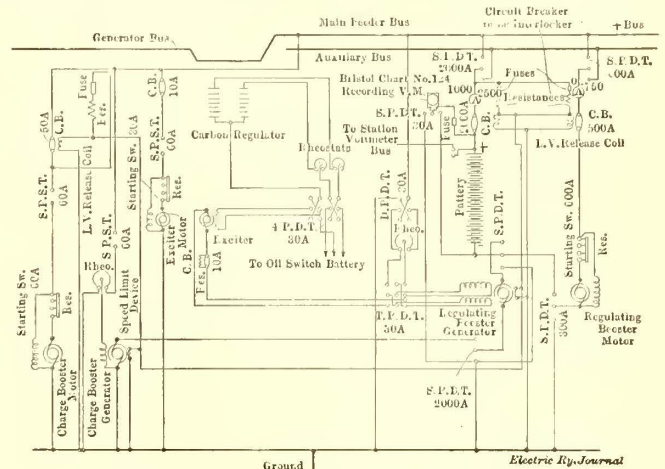
Cleveland Power—Distributing Rack for D.C. Feeders

meters on two phases. Lowest of all are the controls for the line switches.

On the a.c. rotary panels are ammeters and wattless power indicators. The latter show the amount of wattless power necessary to keep the power factor of the outgoing current at unity. A circuit-breaker, an ammeter, a pair of lever switches connected in parallel and a d.c. watt-hour meter are mounted on each d.c. rotary panel. The regulator panels contain a carbon-pile regulator, a rheostat and various control switches. The left-hand battery booster panel is for the motor and contains a circuit-breaker mechanically and electrically interlocked with that on the generator panel. Below this are an ammeter, a four-point motor-starting switch and a double-throw switch for connecting the motor either to the main power bus or to an auxiliary bus.

The circuit-breaker, the ammeter, the positive line

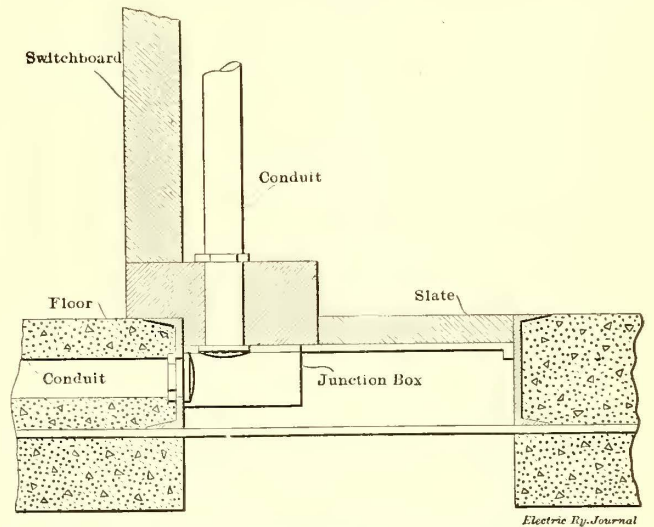
switch and a field rheostat are on the generator panel below. The totalizing panel contains a totalizing ammeter, *A*, and two differentially wound voltmeters, *DV*. In one of these one winding is between the main bus and ground, the other between the rotary positive potential bus, which



Cleveland Power—Battery Wiring Diagram

can be connected to any rotary, and ground. When the two voltages are equal the instrument reads zero. If the rotary voltage is reversed, the voltmeter indicates this fact by a positive reading. The second differential voltmeter is a spare one, but one side of it is normally connected to the converter bus as a check, the reading showing the converter potential. The totalizing panel contains also two recording voltmeters, one for the station bus, the other for the battery voltage. At the bottom of the board are switches for lighting and crane circuits.

The feeder booster panels, for motor and generator, have at the top interlocked circuit-breakers with ammeters directly below. On the motor panel is a four-point starting switch and a single-pole double-throw switch for connecting the motor to either the main or the auxiliary bus. There is also a field-regulating rheostat. On the generator panel is a heavy double-throw switch and a single-throw switch



Cleveland Power—Arrangement of Junction Boxes at Switchboard

below. These are similar to the switches on the adjacent feeder panel.

The bottoms of the lower switches are cross-connected. The purpose of the switches is to permit the first feeder to be operated either with or without the booster and either on the main or the auxiliary bus. To operate with the booster switches *C* and *D* are closed and *B* is opened. To operate

without the booster *A*, *C* and *D* are opened and *B* is closed up or down as desired. The switch *A*, can be closed up or down, raising the voltage from the main or from the auxiliary bus respectively. As explained above, the first feeder panel is interconnected with the booster panels and normally is used in conjunction with it. However, it is possible to raise the voltage on one or more other feeder panels in addition through the auxiliary bus.

The remaining feeder panels are provided simply with circuit-breakers, ammeters and double-throw switches. The busbars are designed for a capacity of 1000 amp per square inch and are built up of 5-in. by 1/4-in. copper.

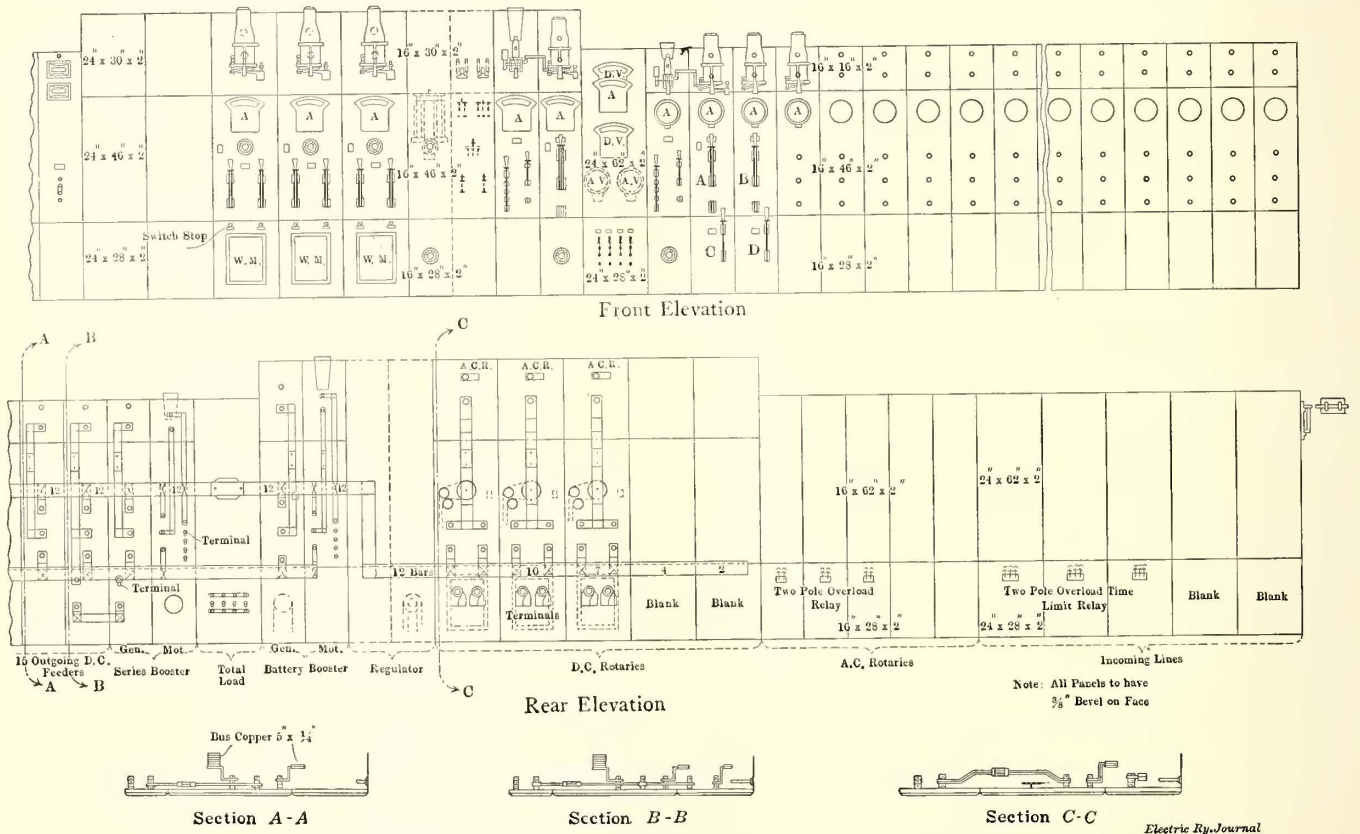
FEEDERS AND LIGHTNING PROTECTION

The feeders are all of 1,000,000-circ. mil cross-section. They are supported on the basement wall and are taken out of the station in a short tunnel, which terminates at the curb line. Iron pipes lined with fiber conduit lead vertically from the tunnel to the overhead distributing rack. On this boxes are mounted to house GE, MD type lightning arresters.

energy storage capacity and operating at the highest allowable rotative speed. The allowable speed was determined partly by the strength of the materials and partly by the necessity for having a fairly quiet machine, the substations being located in residential neighborhoods.

The speed of the armatures is 514 r.p.m. approximately and there are 14 poles. The diameter of the commutator is 40.25 in., appearing very small for the 6-ft. armature. No provisions are made against centrifugal forces other than careful design of the parts.

The armatures of the 1500-kw rotaries are 6 ft. in diameter and weigh 10 tons each. The current and flux densities are much below usual values and very conservative values of current density under the brushes were specified. The commutating poles have but one turn each placed near the armature to secure minimum magnetic leakage. The magnetic circuits of the commutating poles are designed for low saturation and therefore for maximum sensitiveness. No inductive shunts are used with the commutating-



Cleveland Power—Front and Rear Elevations of Switchboard

The iron pipes furnish the necessary choking effect to divert lightning discharges through the arresters and thus render the use of choke coils unnecessary. In addition to the outdoor arresters static discharges are provided on the busbars and aluminum electrolytic arresters are connected across the converters. In case of storm the storage battery is also connected across the converters without resistance, insuring almost perfect protection. The ground connection is made to a 200-sq. ft. plate buried in permanently moist earth and bonded to the rails.

60-CYCLE ROTARY CONVERTERS

The rotary converters are of novel design constructed in accordance with specifications prepared by the power department of the railway company and submitted to several manufacturers. The contract for these as well as for the transformers and auxiliary apparatus was awarded to the Westinghouse Electric & Manufacturing Company.

Unusual precautions were taken to prevent flash-over by the use of liberal quantities of active iron and copper, as well as the use of a very heavy armature having great

pole winding. The adjustment is secured by changing the reluctance of the magnetic circuit by means of sheet steel liners between the commutating-pole cover and the frame which permit the width of the air-gap to be changed. This adjustment is made once for all in the factory.

Squirrel-cage dampers for use in starting and for preventing hunting are mounted in the main pole pieces. They consist of 3/8-in. square bars of special composition. Copper was found to produce too low a resistance to give an effective starting torque so that a small proportion of tin was added and the resistance was thus greatly increased. As an excessive resistance increases the liability of hunting there is a practical limit to its value, and the final proportion of tin to copper which was selected was such as to give the bar one and a quarter times the resistance of pure copper. The bars are screwed to the short-circuiting strips with two screws on each end, thus insuring good contact.

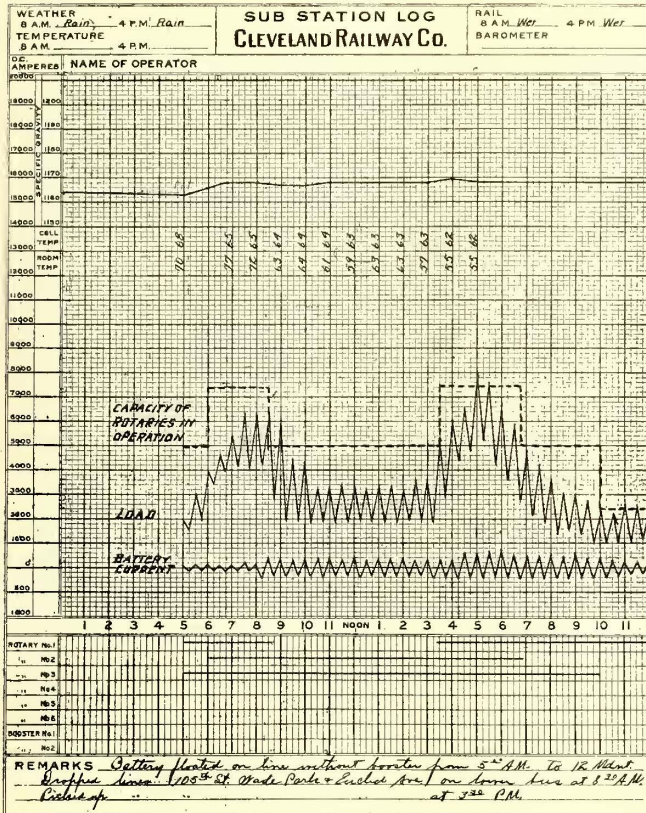
The converters are giving perfect satisfaction and no flash-overs have been experienced. The flywheel action of the heavy armature prevents the effects which usually

follow a d.c. disturbance and the commutating poles take care of fluctuations in the d.c. load. As the power comes from a station containing very large steam turbines, a.c. disturbances are practically absent; hence no provision is made to care for them. Equalizing rings are connected to alternate coils to insure uniform distribution of the armature current. The air inlet at both ends of the armature is closed to reduce noise, yet this does not produce any serious effect on temperature rise on account of the liberal cross-section of iron and copper employed.

STATION RECORDS

The station records are kept in the form of a graphical and numerical log as shown in the sample record sheet. On the back of the log sheets all watt-hour readings are recorded. Printometers are now being installed to supplement or replace the present practice of reading the recording meters at regular intervals, as all indicating meters are read every fifteen minutes.

The records from the various stations are forwarded daily to the office of the power department, where they are assembled and totalized. In order to insure efficient operation of the machines the substation operators trace on the



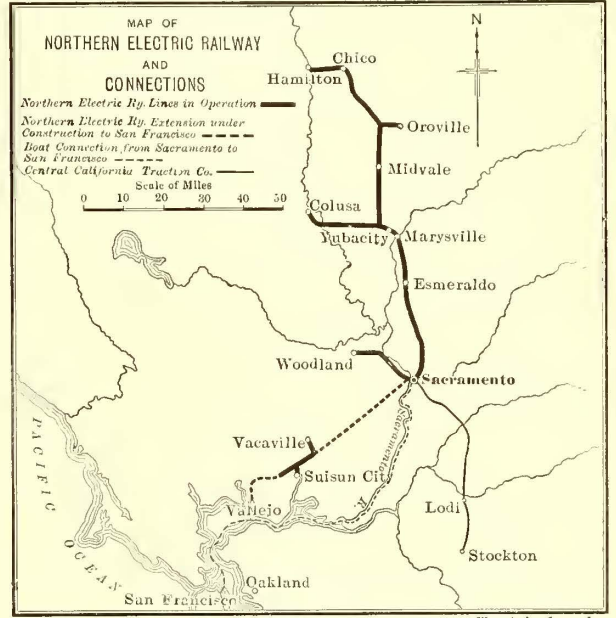
Cleveland Power—Graphical Log at Windermere Substation
graphical log a line showing the operating rotary capacity and thus have constantly before them the degree of loading of the operating machines.

VESTIBULED TRAINS ON SHARP CURVES.

With many interurban roads the through vestibule may be impracticable, owing to numerous short-radius curves. On the Cedar Rapids & Iowa City Railway, however, there are only two curves which are too sharp to permit the passage of a vestibuled train, one at Iowa City and another at Cedar Rapids. In consequence of these two curves a novel procedure has been adopted so that through vestibules can be used. When a train approaches either of the two limiting curves the motorman stops the train and the conductor closes the doors between cars and unhooks the diaphragm curtains. The train is then run around the curve, after which the vestibules are again coupled.

EXTENSIONS PROPOSED IN CENTRAL CALIFORNIA

All of the states on the Pacific Coast expect to profit greatly by the completion of the Panama Canal because of the opportunity thereby offered them of securing a desirable class of immigrants directly from Europe. Nowhere is this sentiment more pronounced than in central California; hence it is not surprising to find there great activity in electric railway promotion and construction. One of the



Projected Extensions of the Northern Electric Railway

most important enterprises under way in this district is the proposed extension of the Northern Electric Railway to San Francisco Bay, as shown in the accompanying map.

A short time ago this company, whose third-rail system operates through one of the most fertile valleys of the State, that north of Sacramento, purchased the Vallejo & Northern Railway, near Suisun City, and now it purposes to use this line as part of its route to tidewater. Active construction work between Sacramento and Vallejo, a distance of approximately 58 miles, is under way. At Vallejo extensive harbor improvements to provide facilities of a terminal character are about completed, as is the cutting of 100,000 yd. of material to secure a harbor approach on private right-of-way and to minimize the grade conditions to a 1 per cent maximum. Vallejo, a city of about 12,000 population, is immediately adjacent to the government navy yard on Mare Island, being separated from it by a deep navigable channel about 450 yd. wide. Mare Island is one of the important government yards, being completely equipped for the building of modern battleships.

The boat trip from Vallejo to San Francisco now occupies about one and one-half hours. This can easily be reduced to one hour and fifteen minutes, allowing five minutes for transfer of passengers. The entire run from Sacramento to San Francisco can then be made in two hours and a half. The towns of Vallejo, Napa, Cordelia, Pierce, Fairfield, Suisun, Cement, Vacaville, Elmira, Dixon, Washington and Sacramento will be served by this road.

The construction and equipment of the Sacramento-Vallejo branch, according to the engineers, will be the very best. They will include heavy traffic rails, crushed-rock ballast, steel-ballasted deck trestles, wide fills, many openings, handsome terminal and station facilities, large high-speed cars for train service and heavy electric locomotives weighing from 80 tons to 100 tons for freight haulage. The passenger equipments are being designed for speeds up to 75 m.p.h. in trains of from five to ten cars. Block signals of the track-circuit type will be installed.

The Flood in the Middle West

The Disastrous Floods of Last Week Are Unquestionably the Worst Which Have Occurred in the History of the Middle West—An Account of Their Effect on Electric Railways in the States of Indiana, Ohio, Pennsylvania and New York Is Given

Following a week of unseasonably warm weather, extraordinarily heavy and long-continued rains occurred throughout the Middle West. These began on the night of March 23 and continued without interruption until March 27. At New Bremen, in western Ohio, the precipitation during this period was nearly $8\frac{1}{2}$ in., and at Indianapolis during the same four days 6 in. of rain fell.

On Monday, March 24, all of the rivers of Ohio and Indiana were reported to be rising rapidly, and soon after flood conditions existed in Dayton and several other cities of Ohio. At Dayton, as reported in the daily newspapers, the entire city was suddenly submerged on March 25 owing to broken levees. The disaster has been laid to an alleged

tracks. The East Liverpool Traction & Light Company had five very heavy slides covering an aggregate of 3000 ft. The Steubenville & East Liverpool Railway & Light Company had about ten slides, covering an aggregate of over 10,000 ft. The Steubenville, Wellsburg & Weirton Railway on the Wellsburg branch was blocked by two small slides and one washout and on the Weirton branch had slides which extended for a mile and a half and loosened one bridge.

These railways went under water, beginning Tuesday, at thirteen separate places in a stretch of 40 miles, covering an aggregate of 5 miles of track ranging from 2 ft. to 12 ft. deep. Interurban service was abandoned on Tuesday.



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Flood Disaster—Scene on High Street, the Principal Thoroughfare in Hamilton, Ohio

failure of the Lorain Reservoir, a large body of water north of the city, but as a matter of fact the long dike inclosing this is still intact with the exception of two insignificant washouts at points where the water was shallow.

THE FLOOD IN EASTERN OHIO

The sudden disaster at Dayton concentrated attention on that point early in the week of March 23, and for a time it was hardly realized that the rains which continued without interruption until March 27 had actually covered the entire State of Ohio.

On the Tri-State Railway & Electric Company, which operates along the valley of the Ohio River and in many places runs alongside of the very high and abrupt hills which border the river, the first trouble began on Monday, March 24. This was due to heavy slides caused by the rains, which buried the tracks in different places. The Ohio River Passenger Railroad was covered in several different places, aggregating probably a full mile of both

From Thursday, March 26, until Saturday, the 29th, the entire 60-mile stretch of railway was tied up. By herculean effort traffic was opened from Midland, Pa., to Wells-ville, Ohio, a distance of 10 miles, early on Saturday morning. Continuing the work, which included the removal of scores of slips which buried both tracks, the line was opened to Steubenville, a distance of 30 miles. On Monday evening and later it was cleared eastward to Beaver, Pa., 26 more miles. It was a task fraught with considerable difficulty, and W. R. W. Griffin, general manager, assumed personal charge of the work. Besides the cost of rehabilitation, the company will lose the normal receipts for the period during which cars were not in operation.

The Youngstown & Ohio River Railroad Company reports that the damage sustained from floods will not exceed \$1,500. The service was affected but slightly.

CONDITIONS IN NORTHERN OHIO

The Toledo, Bowling Green & Southern Traction Com-

pany reported from Findlay, Ohio, that it had suffered a loss of about \$15,000 by reason of the flood. The power house had several feet of water in the basement, which shut down the electric light and railway service for two days. The company, however, managed to give service between Portage and Bowling Green, Ohio, by securing power from the Lake Erie, Bowling Green & Napoleon Railway.

The Lake Shore Electric Railway reports some small washouts which were not serious. No bridges were lost. The great trouble was from a sleet storm which carried down many high-tension lines. The flood at Fremont was 16 ft. in depth in one of the streets over which the railroad operates. About 8 ft. of water came into the shops and a like amount in the boiler room. The water at one time stood 2 ft. 6 in. above the engine room floor in the power house, sufficient to water-soak all of the electrical machinery. Just what damage there may be to generators and transformers cannot be yet estimated, although the company hopes that it is not so great as to make unprofitable the work and expense of drying them out. The entire road is operating with about two-thirds service west of Norwalk and Sandusky to Toledo.

On the Lake Shore Electric limited trains were routed by way of Sandusky and the Detroit-Cleveland service was

that when the deluge first struck Akron and vicinity it was believed that the damage would be extremely great. The basements of the power houses were filled with water for a short time, which interfered with the operation temporarily, and the tracks in the lowlands were covered with water, necessitating the transfer of passengers. In addition, a number of transmission line poles were wrecked and a small bridge near Akron was washed out. Although the flood was stated to be the worst ever heard of in this section of the country, the company's losses at this time are estimated not to exceed \$10,000 on property and \$15,000 on earnings.

On the Western Ohio Railroad the only serious damage resulting from the recent floods, it is stated, was the washing out of a 160-ft. two-span steel and concrete bridge at Lockington, Ohio. The repair of the rest of the damage, which consisted of a number of minor washouts, has been about completed at a cost not exceeding \$1,000. No train service was operated on Tuesday, March 25, but on the 26th and 27th regular service was started from Beaver Dam, Lima, Wapakoneta and St. Mary's to Celina and from St. Mary's to Loramie. Regular service from Findlay on the north to Sidney on the south and Celina on the west and to Loramie was commenced March 28. There was no interruption to the power and lighting service.



Flood Disaster—Overturned Interurban Car Opposite New Y. M. C. A. Building in Dayton, Ohio

resumed on Monday. At that time the Fremont bridge was still giving trouble and the machinery of the power house at that point was soaked. It will be thoroughly dried out and perhaps baked before being put into operation. This, with small washouts and other minor damages, with loss in receipts of perhaps \$10,000, constitutes the loss to the road. The Fremont-Lima line is said to be pretty badly damaged in places. No cars were being run over it early in the week. The Cleveland-Lima service of the Lake Shore Electric Railway was suspended when the water came up at Fremont and Lima.

The Cleveland, Painesville & Eastern was operating fairly well Monday. Water got into the power house at Painesville and put it out of commission. The line was operated with power from the Cleveland Electric Illuminating Company over part of the distance and the company's other equipment took care of the remainder.

The Northern Ohio Traction & Light Company states

The Toledo Railways & Light Company suffered little property loss by reason of high water, although the high wind of March 23 blew down a number of poles and two steel smokestacks. There has been no interruption to the service furnished the public by the transportation, electric, heating and artificial gas departments. For three days, however, the main power house on Water Street was completely surrounded by water to a depth of some 3 ft., which rendered the operation of the plant very difficult. The result might have been serious had not the operating force bricked up windows and surrounded the machinery operated in the basement with brick walls to keep out the water. The condenser pumps and the other auxiliaries were pressed into service to remove the water which leaked into the basement.

It is expected that the operating expenses will be greatly increased on account of the flood, on account of the inability of the railroads entering from the coal fields to

operate through service, thus causing a shortage of coal. However, the company has enough coal in Toledo to operate for a number of days.

At the Mansfield Railway, Light & Power Company power plant the high water got into the wheel pit and necessitated cutting four of the large belts at the power house. All light and railway service was suspended from 2.30 a. m. Tuesday, March 25, until 6 p. m. Friday, March 28, when the company was able to restore electric light service.

The interurban track between Mansfield and Shelby was damaged to the extent of about \$1,000. Partial service on the railway was resumed at 9 a. m. on March 29.

The Pennsylvania & Ohio Railway Company and the Ashtabula Rapid Transit Company both report that they suffered no loss whatsoever. Schedules were not affected with the exception of the larger part of one day when the overflow of a small stream near the village of Jefferson prevented cars from reaching the southern terminal of the lines.

Service on the Detroit, Monroe & Toledo Short Line was not seriously interrupted. In order to insure safe operation, however, limited service to Detroit was discontinued for three days. A four-hour interruption in the local service occurred at Monroe, Mich., where the tracks were submerged, making it necessary to transfer passengers. The total loss to this company is considered to be only that coming from reduced traffic.

Flood damage to the Toledo & Indiana Railroad, operating between Toledo and Bryan, Ohio, 56 miles to the west, was slight. A 6-ft. concrete culvert just west of Toledo was washed out, making it necessary to transfer passengers for two days. This opening was near a highway bridge which withstood the flood and made transferring possible. It is estimated that the arch and back-filling replacement will cost \$2,000.

The Toledo & Indiana Railroad Company was one of the three lucky lines running into Toledo. The damage was light, merely the washing out of some track along the side of a macadam highway where the transfer amounted to only 300 ft., and cars were running over the temporary structure in 18 hours. The flood involved practically no interruption to traffic.

The Northwestern Ohio Railway & Power Company, operating a line between Toledo and Marblehead, Ohio, 53 miles, suffered flood damage only from the traffic standpoint, this being estimated at \$2,000. For six days 1½ miles of track just east of Oak Harbor, Ohio, was submerged under 24 in. of water. Fortunately it was necessary to discontinue operation of this section at a time when there were a sufficient number of cars to give regular service on both sides of the break. No special difficulty was experienced in transferring passengers. On account of a 4-ft. settlement in the Cherry Street bridge over the Maumee River in East Toledo this company's cars could not enter the city. A new bridge under construction alongside, however, was made ready for traffic as quickly as possible, through service being resumed on March 30. The windstorm on March 21 blew down several poles, interrupting the transmission and trolley lines for three hours.

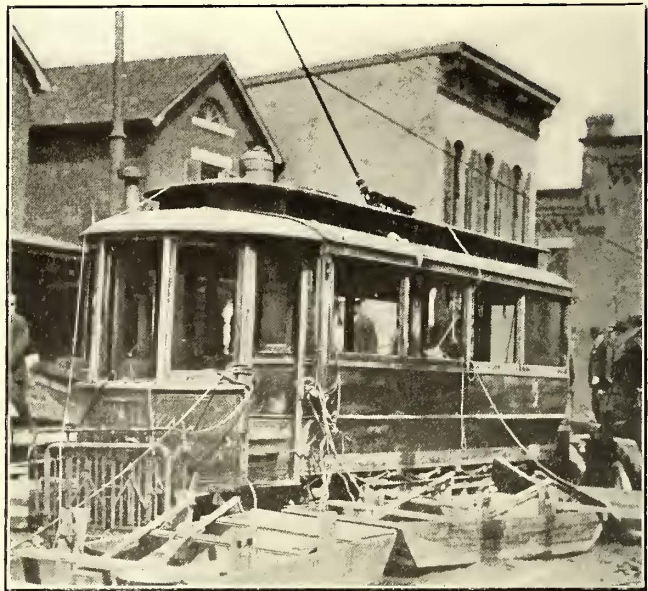
DAMAGE IN CENTRAL OHIO

Following the interruption to traffic during the previous week, local cars were put into operation on regular schedules over the entire system of the Cleveland, Southwestern & Columbus Railway Company on the morning of Sunday, March 30, and the limiteds began regular operation Tuesday morning. The power station at Elyria was not injured to any extent, although the water was within 4 in. of the engine room floor at one time. A bridge near Galion was washed out completely, but the use of a wagon bridge has been secured until repairs can be made. Abutments here and there were rendered unstable, but have been repaired. Between Ashland and Mansfield half a mile of track was almost completely washed out. This has also been replaced.

On the western division heavy sleet storms last week resulted in breaking wires in a number of places.

The Columbus Railway & Light Company, whose whole system was almost entirely out of commission for several days last week, was able to offer an almost normal service Sunday morning, except on the West Side, where the tracks are in bad condition and in some places covered with debris. Service will be given to that section as soon as the tracks can be got into condition.

The Ohio Electric Railway Company has begun the construction of a temporary bridge across the Scioto River at Mound Street in order to provide for the admittance of cars to the city from the Columbus-Springfield division. These cars cannot come into the city from the west now. Regular service, including express service, is maintained between Columbus and Newark and cars are operated east of Newark to Black Hand, a distance of 12 miles. The company's engineers have found that the Y bridge at Zanesville is not badly damaged, and it is expected that its service will reach West Zanesville within a short time. With the help of two portable substations an attempt will



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Flood Disaster—Home-Made Boats Moored to Abandoned Car in Dayton, Ohio

be made to operate the local lines there, as well as furnish light. Flood damage to the company's lines east of Columbus was slight, but water entered the power house at Hebron, causing a shut down of one-half day. Several small washouts of track occurred between Newark and Zanesville, where the road parallels the Licking River, and blocked traffic for one week.

The Ohio Electric Railway is furnishing regular service between Springfield and Durbin. A section of track, 200 ft. long, has been completely washed out near Dayton, and until this is replaced service cannot be furnished that city. Cars are in operation between Springfield and Urbana. Service between Fort Wayne and Lima has been abandoned for some days owing to serious washouts near Monroeville, Ind.

The Scioto Valley Traction Company, operating 78 miles in two divisions out of Columbus, had regular service interrupted for twenty hours on account of the high water submerging two bridges just outside of Columbus. Through service has, however, been resumed to Lancaster and to a point within a half mile of Chillicothe, where the deck has been washed away from 800 ft. of trestle. Physical damage to this road is estimated at \$5,000. Repairs to the Chillicothe bridge have been completed, and regular service will be resumed April 5.

The Columbus, Delaware & Marion Railway was so fortunate as to escape material damage to track and roadway, but all its rolling stock was seriously injured by flood water. Temporary service was resumed by borrowing a car from the Columbus Railway & Light Company. It is estimated that the physical damage will amount to \$15,000, and in addition lost revenue will amount to \$20,000.

The Dayton & Troy Electric Railway Company has suffered to some extent from washouts, which, however, were located at points which were difficult of access for repairs. Service was re-established between Dayton and Piqua on April 3 and at that time the damage to the property was estimated at \$30,000. The city of Piqua sustained heavy damages and practically every house in town was found, after the flood subsided, to contain heavy mud averaging 5 in. in depth. All of the bridges across the Miami River were badly damaged.

CONDITIONS AT COLUMBUS

From Columbus, Ohio, it is reported that the high water on the Scioto River reached the unprecedented mark of 22.9 ft. on Tuesday noon. All except two of the bridges on the west side of the city over the Scioto and Olentangy Rivers were washed away. About one-fifth of the popula-

Two small 500-kw turbines were later dried out and are now helping to carry the load. Fortunately two old reserve stations which were about to be dismantled were outside of the flooded area and enabled the company to give limited service during the flood period. Service was more or less demoralized, however, as about 250 of the platform and station men lived in the flooded district. None of these employees reports loss of life in his family, but many suffered loss of property.

The company has hired help to clean up the houses of its employees and has relieved the city of the necessity to furnish them with supplies. Regular schedules through the flooded district have been abandoned temporarily as the two bridges used to reach the business district have been destroyed. On April 2 108 cars out of the normal equipment of 125 were on regular schedule. The shortage of cars has temporarily cut down schedules on the West Side of the city, but as fast as the electrical equipment can be dried and the mud removed it is being added to the service. The method of drying out the large units at the Spring Street power station is interesting. This station contains several 1000-kw generators direct-connected to horizontal engines. The generators were housed in with wood and



Flood Disaster—Debris Covering the Street Railway Tracks in Dayton, Ohio

tion living on the West Side was entirely cut off from communication until the morning of Friday, March 28, and the entire city was without street lighting after the night of March 24. Transportation was, however, resumed on Friday morning on a number of the railroads, and within a few days nearly normal train service prevailed on all roads.

The Columbus Railway & Light Company estimates its loss in damage to property at \$200,000. This amount added to the loss in revenue from traffic will total in excess of \$250,000. Seven cars were so badly damaged by the flood that they are considered a total loss. All but one of these were double-truck prepayment cars.

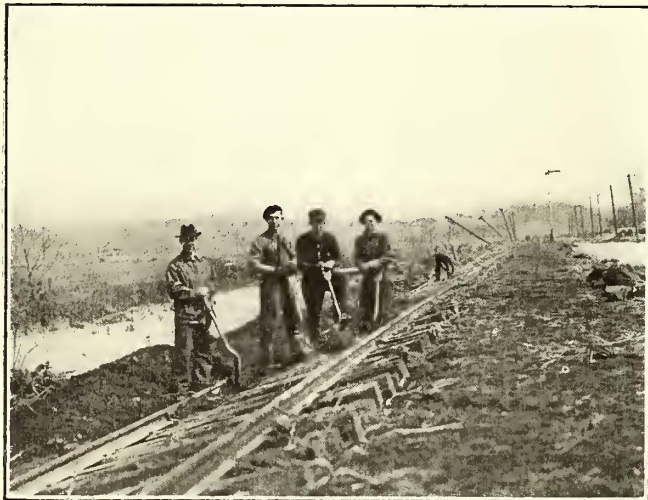
The West Broad Street carhouse is practically a total wreck. This building faced the direction of the flood. Consequently the doors were forced open and the force of the current and drift pushed all the cars through the rear of the building. An undermined brick house on an adjoining lot fell into one bay, completing the wreckage. One mile of double track in West Columbus, which was the district devastated by the flood waters, was washed out and was so badly twisted and broken that it cannot be used. Six feet of water entered the engine room of the Spring Street power house and put it entirely out of service for sixty hours. A 1500-kw Curtis turbine which was submerged up to the electrical end was the first unit back in service.

composition roofing and four hot-air gas heaters set at the corners of the housing. A large vent at the top and two 30-in. blowers provided circulation while the armature was revolved at a slow speed. Sufficient heat was supplied by the furnaces to keep the temperature in the housing at 220 deg., or just above the boiling point of water. The first unit required one week to be dried in this manner.

In the company's efforts to maintain service through the flood period a Curtis turbine was run when the step and guide bearings were submerged. This resulted in badly scored bearings making replacement of these parts necessary before the unit could be put back in service. All switchboards in the station were put out of service by the flood and a temporary one was rigged up to handle the load coming to the three turbines first put in service. This temporary switchboard was built of store-box lumber, crude but effective. High-water mark showed at 6 ft. on the switchboards, and this damaged practically all recording meters. The switchboard-regulating coils were taken to a vacuum drying plant and after the dried silt had been removed they were returned to service. When the water had receded to the engine-floor level a professional diver was called to open the pump valves in the basement. From 2 in. to 6 in. of mud was left on the engine-room floor and from 6 in. to 24 in. in the basement.

CONDITIONS AT LIMA, OHIO

Damage from floods in the immediate vicinity of Lima is slight, but both the Ohio Electric Railway, which makes this point headquarters for the northern district, and the Western Ohio Railway have had considerable property wrecked and inundated at various points some distance away. The latter company is probably the greatest loser, from both a traffic and a physical standpoint. At Lockington, Ohio, just north of Piqua a truss bridge over the Loramic River, consisting of two 90-ft. spans on concrete abutments and piers, is a total wreck. The middle pier underscoured, dropping both spans into the river. These blocked the channel and the undermining of both abutments followed. One fell into the river, and the other is so badly out of line it cannot be used. At another point the failure of a small reservoir washed gravel 6 ft. deep over the track for a distance of 500 ft. Near this point 300 ft. of track and the overhead lines were washed from the roadbed. This was the only break in the transmission and trolley lines on the system. Near Lima a 75-ft. through-truss span was damaged from underscoured abutments. Operation over this structure was discontinued until repairs could be made, but it is being used for transferring



Flood Disaster—Scene on the Ohio Electric Railway Between Springfield and Dayton

and at Leipsic made it necessary to discontinue through service from March 25 to March 29. The Fort Wayne-Lima division was more seriously damaged. Approximately 6 miles of track between Monroeville, Ind., and Dixon, Ohio, was submerged four days. At Middlepoint, Ohio, and east of Delphos occurred the only washouts on this division. At both of these points 500 ft. of track was undermined 5 ft. deep. The substation near Middlepoint was the only one to be put out of service by the flood in this district. A few inches of water on the floor grounded the transformers, but the interruption was of short duration.

The most extensive damage to track in the northern district was found on the Lima-Defiance division. Twenty-five hundred feet of track was washed from the roadbed but fortunately away from the pole line, leaving it undisturbed. Through service on both the Springfield and the Defiance divisions was not resumed until April 5. A remarkable and fortunate circumstance in connection with the floods in this district was that at no time was service interrupted on account of overhead lines being down. In fact, the Ohio Electric offered the only means of telephone communication with the outside world for five days. An-



Flood Disaster—Result of the Flood at Enon on the Ohio Electric Railway

passengers. Two steel and concrete bridges on the Lima-Findlay line were slightly damaged owing to undermined abutments, but did not seriously interrupt traffic.

It is believed that the destruction of the Lockington bridge will prevent the operation of through service between Dayton and Toledo for some time, but on all other lines regular service was resumed after an interruption of three days. A conservative estimate of the financial loss to this company, from both the physical and the traffic standpoint, is placed at \$75,000 by F. D. Carpenter, vice-president and general manager.

The northern district of the Ohio Electric, comprising over 147 miles, experienced complete tie-up of all service for four days. In a few instances it was possible to make some short trips, but traffic was so demoralized that these were hardly worth while. On the Lima-Springfield division two small bridges were washed out near West Liberty and at three other points the track was submerged under from 4 ft. to 6 ft. of water, in sections from 200 ft. to 1½ miles in length. In each of these instances it was back-water, and after it had receded the damage amounted only to soft track. A small washout on this division near South Warsaw, 200 ft. in length and 6 ft. deep, forced the abandonment of through service until April 2.

On the Lima-Toledo division inundated track at Ottawa, where there was 3 ft. of water in the passenger station,

other interesting fact is that not a single car or motor was damaged. It is estimated that damage to physical property on this district will total not more than \$10,000.

EXPERIENCES AT SPRINGFIELD, OHIO

The Springfield, Troy & Piqua Railway was so badly damaged by the recent floods that all service was abandoned from March 25 to April 3. Mr. F. J. Green, vice-president and general manager, estimates his loss in property damaged and traffic lost at \$30,000. A large portion of this sum is chargeable to property. The track was washed out at six different points between Springfield and Troy, Ohio, and a 60-ft. timber bridge was totally destroyed. Near Troy the bridge over the Miami River was forced badly out of line by drift, and a pile bent washed out of a timber bridge in the same locality. This road did not fare so well as some others with its transmission and trolley lines. Twenty-seven poles went down and eighteen of these were carried away by the flood. A forty-eight-hour interruption at the Mailland generating station was caused by water entering the basement where the oil switches are situated. This power failure also affected the Springfield & Xenia Railway, to which it supplies energy. The discontinuance of service over the latter line, however, is the only loss it suffered.

Between Springfield and Dayton on the Ohio Electric line, a distance of 27 miles, the devastation wrought by the

Mad River was amazing to behold. Several miles of track were washed from the roadbed and covered with driftwood. In many instances the track was turned completely over or bent in indescribable shapes, just as though it had been ordinary telephone wire. There also were two breaks in the trolley and transmission lines on this line. In all, about 4 miles of track was washed off the roadbed, and a river channel occupied its place.

Fortunately the substations and the power station, which is situated at Medway, were built on high ground not touched by the flood waters. Owing to the destruction of the banks of the station feedwater channel, however, it was necessary to shut down this plant for four days, owing to lack of sufficient water. This interruption in power supply also made it necessary to discontinue service on the Springfield-Columbus line, which was not seriously damaged by high water. The failure of the Town Street bridge at the Columbus end of this line cut off entrance to the city. At the present time Dana Avenue, West Columbus, is the eastern terminal. Repair work is being rushed by large forces of laborers on all lines north of Dayton, and it is hoped that all regular schedules may be resumed by April 5. The total loss of revenue from traffic was estimated at \$100,000.

The experience of the crew on the last car to attempt to enter Columbus may be of interest. When it reached Town Street the flood came down upon it unexpectedly. The crew, however, thinking the water would not rise very high, remained on the car. In a comparatively short time the water reached the car floor and, thinking that precautions for a few feet more rise would be best, one of the crew caught a pair of wooden steps floating near. These were placed on the backs of the seats. The rapid rise in the water soon reached this point of refuge making it necessary to wade through the water in the car to the vestibule where access to the car roof was to be had. After being marooned on the roof of their car for more than twelve hours a passing boat picked them up and took them to Mount Carmel Hospital, where they remained on the upper floors with others for four days.

The Springfield Railway Company lost but little from damage sustained by floods. Water entered the generating station causing a shut-down of twelve hours. It also reached one of the carhouses, but this was anticipated sufficiently in advance so that all cars were removed to high ground. Practically the total loss, estimated at \$1,000, was confined to ties which were carried away by the high water.

CONDITIONS IN DAYTON, OHIO

Water from Mad Creek first passed over the levees from 4 ft. to 7 ft. deep at a sharp bend 2 miles above the water works early Tuesday and was augmented by the Miami Canal diversion at Findlay Street and two 300-ft. breaks below the canal river crossing, where two of five spans were carried out.

About 9 a. m. a break occurred near Main Street, converting the thoroughfare into a swift channel about 12 ft. deep. Thousands of yards of asphalt pavement were lifted from the street surface. Smaller houses were crushed or carried off their foundations. The Mad River overflow discharge followed the Big Four tracks and the canal through the factory section, reaching the second floors of buildings in many cases. The Second Street Cincinnati, Hamilton & Dayton Railroad freight station was wrecked.

At the water works the old boiler room floor was under 12 ft. of water and the new boilers were submerged 16 ft. The men escaped to the second story of the pumping station. The water subsided on Thursday and by Saturday afternoon fires were started. Seventy-five tons of coal were washed away, but the fuel was found on the streets and confiscated. The State militia impressed idlers into service. Springfield and the Pennsylvania Railroad sent men. Pumps were entirely submerged under 12 ft. of water over

the ground floor. Three pumps delivering 35,000,000 gal. per day were started on Saturday afternoon with 40-lb. pressure, instead of 80 lb., in the mains.

Debris washed against the Sixth Street bridge made a dam which caused the water to flow east toward Main Street. A dump below the mouth of Mad Creek narrowed the channel and not only caused breaks in the levees but also caused the water to flow several feet deep over them.

Conditions at Dayton are in such a turmoil that it is impossible to estimate the loss of property and revenue to the electric railways. From the standpoint of property loss, the Ohio Electric Railway probably was the greatest sufferer. On its Dayton-Cincinnati division practically all important bridges are out and miles of track and overhead lines have been washed off the roadbed. An eight-span 1000-ft. through-girder bridge across the Miami River near Middletown is a total wreck. Two other bridges across the river, one a footbridge at Chautauqua and the other at Russ Bridge in the spur line to Germantown, Ohio, have been washed away. A county bridge over which the Cincinnati division operates at Hamilton also has been destroyed by the flood. It is estimated that 5 miles of track will have to be rebuilt and 15 miles of transmission and trolley line will have to be straightened up and wires strung. Although the bridges went out with the flood, the steel transmission line on the Dayton-Cincinnati division cut off the source of energy to the Dayton-Richmond and the Dayton-Union City lines. A few small track washouts on these latter lines have been repaired and regular schedules will be resumed as soon as energy can be obtained. A section of the Union City line between that point and Brookville is furnishing service with energy supplied by the Indiana Union Traction Company's Anderson station. It is hoped that the transmission lines will be rebuilt by April 5. Operation from Hamilton to Cincinnati was not seriously interrupted, as the power station at Lindenwald, just south of Hamilton, was not put out of service by the high water.

A portable substation at Miamisburg was completely submerged. There were also three cars at this point. The replacement of the bridges on the Dayton-Cincinnati division will delay through service between these points for some time. The Dayton Street Railway lines, which include the City Railway, Dayton Street Railway, Oakwood Street Railway and the People's Railway, were tied up by debris in the street as well as by lost bridges. The City Railway lost a number of cars which were caught in the flooded district, but the other companies were more fortunate. The shops and carhouses of the other companies were reached by the flood, but the water did not attain a height sufficient to damage equipment. The City Railway also had water in its power house and the work of drying out the generators is under way. Neither the Dayton & Troy Electric Railway nor the Dayton, Covington & Piqua Traction Company suffered serious damage from washouts, but regular schedules were interrupted. The former company cannot reach its Dayton terminus, owing to the condition that three houses are blocking the track in the Dayton streets. This company also had a few short stretches of track washed out, and through service has been interrupted at Troy by the underscoring of two abutments in an undercrossing with the Big Four Railroad. Both abutments were overturned, thus blocking the electric railway track. However, passengers are being transferred at this point. The most serious loss to the company will be that from revenue, as service was abandoned for three days on account of high water.

All generating stations in the Ohio flooded district are confronting fuel shortage because the steam roads on which they depend for coal are too busy repairing their lines to do more than run relief trains. In order to economize in this direction, motormen have been instructed to run their cars on the second controller points.

THE FLOOD IN INDIANA

Almost immediately after the tornado which struck the western part of Indiana, on March 23, Indianapolis became the center of a flood-bound district that covered almost the entire State. Steam railroad as well as interurban railway service was abandoned temporarily and conditions were stated to be worse than at any other time for twenty-five years.

The theories in regard to the cause of the flood appear to have settled pretty definitely on one or two matters. The heavy fall of rain started on March 23 and continued with unusual violence on the following day, reaching water-soaked ground that could not carry it away. It flooded the White River and tributaries so seriously that the result was a high stage that exceeded by 5 ft. or 6 ft. the previous high stage reached in 1904. The 1904 stage was unprecedented in the history of the city. In addition to the enormous volume of water thus indicated, the size of the channel of the White River had been narrowed when the West Washington Street bridge was constructed to replace the

great was the rush of the released waters when they reached the power plant, shops, carhouses and certain sections of the city where the tracks were flooded.

The newest large improvement in Indianapolis made by one of the electric railway companies in that section of the State was the West and Tenth Street power house of the Terre Haute, Indianapolis & Eastern Traction Company. This is not the property of the local Indianapolis system but is used for the supply of power both to the interurban and to the city systems. In view of the floods to which Indianapolis has been subjected at times in the past, it was believed that every necessary precaution was observed in the selection of a site for the West Tenth Street power house which would assure its safety in time of danger of this character.

The break in the levee on the White River above the West Tenth Street power plant, however, released a large volume of water that caused temporary interruption but only slight damage to the transformers in the basement of this plant. The levee break released a volume of water



Flood Disaster—Washington Street Bridge in Indianapolis After Its Collapse

one carried away at that point in 1904. The task before the city is indicated by the statement of H. W. Klausmann, city engineer, that he favors the reconstruction of the riverbed and levees along the tributary Fall Creek on lines that will provide, if necessary, for wide enlargement of the channel and condemnation of private lands for that purpose. It is also reported that there has been encroachment by private land owners on the eastern bank of the river which has had the effect of narrowing the channel still further. A street, Perry Avenue, was opened along the west bank of the river about seven years ago, and the theory in Indianapolis is that this also contributed to the narrowing of the channel and thus to the flood.

INDIANAPOLIS TRACTION & TERMINAL COMPANY

While the actual difficulty with service conditions in Indianapolis began about noon on Tuesday, March 25, the alarming condition of the water, levees and bridges in and near the city before that time had prepared the officials of the Indianapolis Traction & Terminal Company for probable greater trouble.

So far as efforts could be made in advance to minimize the effect of the flood of water that was feared, they were carried out, but the results were effective only in part so

that seemed, when viewed from this point, to increase the height of the flood 15 ft. to 20 ft. inside of thirty minutes. While, as stated, the water flooded the basement of the plant it did not reach the turbine room or affect in any way the stability of the fine structure itself. Signs of damage on the grounds immediately surrounding the West Tenth Street power plant, however, give some indication of the terrific force of the flood of waters. The embankment and track of the Belt Railroad were entirely washed away. This is the road on which the traction company depends for transportation for its supply of coal. In addition part of the spur track which the traction company uses to haul cars of coal by electric locomotive from the Belt Railroad track directly to the power house was partly washed out, although the damage apart from the track which was washed out was confined at that immediate point to the loss of the contents of a carload of coal which was overturned when the track embankment gave way. The electric locomotive was on a section of the track which remained solid. Before the cables leading from the plant across the White River went down in the flood they were cut.

Among the loss sustained by the company at this point was about 1000 tons of coal which was carried away by

the rush of the water and disappeared completely. There is still abundance of coal on hand, however, for this plant. The site on which the West Tenth Street power plant stands is one of the highest points in the vicinity and it now stands far above the fast-receding waters. Originally this ground was somewhat low, but in order to raise it above all the danger points known in the history of the city of Indianapolis it was filled in before the new plant was constructed.

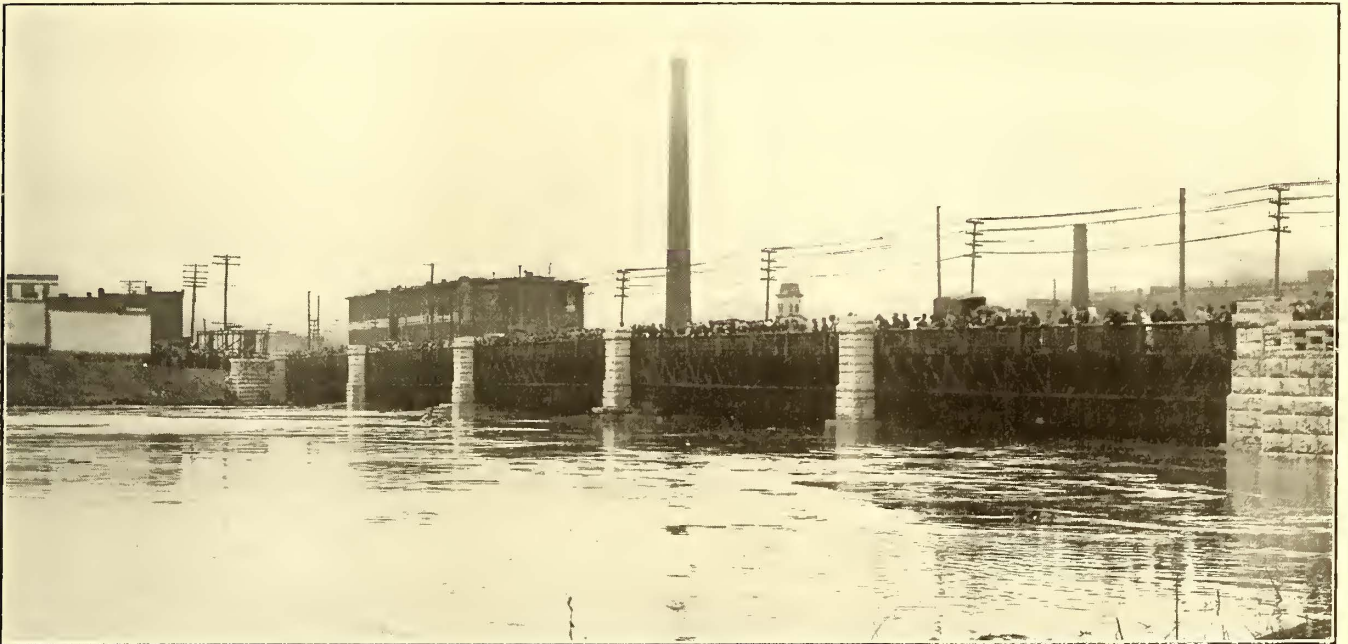
As soon as the water receded at the West Tenth Street power plant the work of restoration of the track of the Belt Railroad was begun and rapid progress is being made. This work is being done by the forces of the traction company working for the Belt Railroad Company.

POWER SUPPLY IN INDIANAPOLIS

Part of the West Washington Street power plant was acquired by the Indianapolis Traction & Terminal Company from the old Citizens' Street Railroad Company at the time of the consolidation, but additions have been made to the plant since that time. This plant is adjacent to the shops and carhouse on the same street and is in the part of the city which suffered most severely. In this plant the water reached a height of 17 in. in the engine room, flood-

served as the headquarters of the commissary department established by the Indianapolis Traction & Terminal Company for the accommodation of its employees. About thirty refugees camped in the building.

It was in the West Washington Street Power plant that the damage occurred which was the immediate cause of the interruption of the Indianapolis city service. All the efforts of the management consequently were directed toward the restoration of normal conditions in this plant. The equipment, of course, was so thoroughly wet through that nothing whatever could be done until the water receded, and then time and patience were the two factors that with constant hard work on the part of both the men and the executives of the company finally brought slow success first in one unit and then in another and another and so on until normal conditions were reached. As soon as the water began to recede the work of cleaning the apparatus and floors was started. The men worked without interruption for sleep or much rest until the worst part of the conditions began to show some sign of improvement and definite steps could be taken to dry out the apparatus. Although rubber boots were scarce in Indianapolis and finally became unob-



Flood Disaster—Washington Street Bridge in Indianapolis Before the Crest of the Flood Was Reached

ing all the electrical equipment and thus necessitating almost a complete suspension of service on the city lines. The flood, of course, reached a much higher point in the adjoining shops and carhouse, where the water rose to about 7 ft. from the ground and flowed rapidly through the buildings, covering everything with a thick coating of mud and debris.

In anticipation of the flooded condition of this part of the property the officials early on the morning of March 25 removed as many of the cars as possible from the West Washington Street carhouse and stored them temporarily on streets in the higher section of the central business district of Indianapolis. As this section was entirely free of water the cars were therefore ready for service as soon as power was available. The men in the shops remained at work until the water reached the building, when they climbed out of the way and made their way across the roof to the storeroom building which is located directly south of the power plant. When the water subsided this building was used as headquarters by the militia that under orders of the Governor assumed control of affairs in the West Indianapolis district as quickly as possible after the height of the flood was reached. The building also

tainable at any price, the company was fortunate in securing part of a supply early and had 110 pairs of these useful articles of clothing to distribute among its men. The regular force at the power plant remained on duty for about forty hours and they were joined in this by officials of the company. As soon as the water had receded from the engine room the company began running the generators continuously on open circuit in order to dry out the armature and fields in the shortest possible time and tested out the machines two or three times a day to see how the work of drying out was progressing.

President Robert I. Todd of the Terre Haute, Indianapolis & Eastern Traction Company concentrated his efforts mainly on the power situation and made his way between Indianapolis and the West Washington Street power plant by boat. He stayed at the West Washington Street plant from noon Tuesday, March 25, until the afternoon of the following day. Vice-president E. B. Peck remained all night at the headquarters in the Traction Terminal Building, where reports from the various parts of the system extending in different directions were received as far as the telegraph and telephone facilities permitted. Superintendent G. K. Jeffries and other officials of the operating

departments were on duty continually to work and direct the work of relief as effectively as possible under the crippled conditions prevailing in the city at large.

These conditions were greatly complicated by the failure of other public utility service and by the natural confusion and alarm into which the whole city was thrown. While the electric railway service was affected in the manner described the entire city was struggling under other con-



Flood Disaster—Abandoned Car, West Michigan Street, in Indianapolis

ditions arising from the unprecedented situation. The water service in the city failed on Tuesday morning, March 25, before the electric railway service was discontinued and for three days the city was without the usual water facilities. When the water service finally was resumed this was accomplished by means of a centrifugal pump owned by the Merchants' Heat & Light Company which was used to pump water into the city mains. This water, although not safe for drinking purposes, was a great aid in the restoration of normal conditions in the city. The electric lighting companies had comparatively little trouble, but the gas service was entirely suspended in certain sections of the city.

INTERRUPTION OF CAR SERVICE IN INDIANAPOLIS

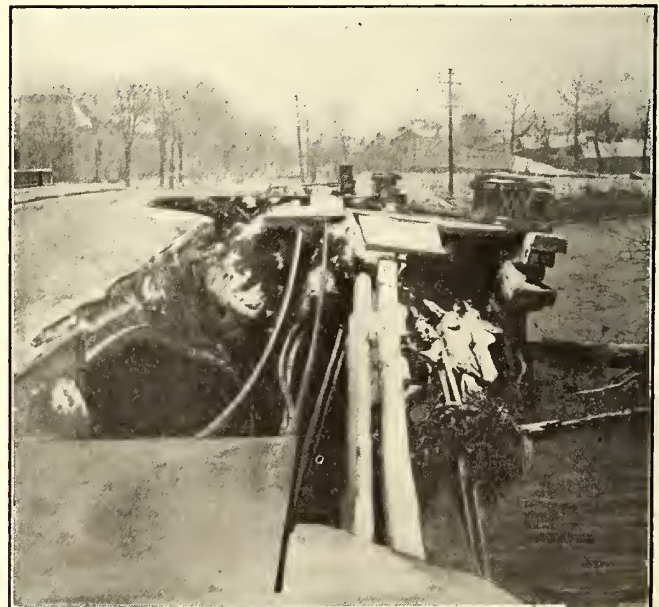
The company operated the cars up to nearly the normal schedule until the suspension of service occurred on March 25. When the service was necessarily discontinued of course the cars remained standing in the streets in all parts of the city. The trainmen were instructed to remain with their cars and to keep up the heat in the stoves. The relief committee which was in charge of the work of lessening the distress arising from the flood requested the company to do this as far as possible, and in accordance with this plan the cars were used as places of refuge for those who needed them. A few of the cars, of course, were caught in sections of West Indianapolis or other parts of the city where the flood reached them so quickly that their movement to places of safety was impossible. Several old sand cars were caught in flood water and washed away. No damage of material amount was done to cars and where the motors were wet in some instances they dried out very quickly.

The trainmen and all employees in the other departments of the company with the exception of one group of linemen proved perfectly loyal to it in this time of trouble. No greater degree of loyalty could have been displayed by the employees as a whole than was evidenced through the entire period. In spite of discomfort and inconvenience the men worked willingly in water and cold to protect the property and improve conditions as rapidly as possible. Ten men employed as linemen thought that the time was an opportune one to demand an increase in wages and threat-

ened to strike if they did not receive what they wanted. They were discharged immediately and no difficulty was found in securing other men to take their places. When the foreman in charge of the men refused to meet their demands they tried to take their tools away with them. Lieutenant Hill of the militia forced the men to give up their tools and leave the district as otherwise the work of relief would have been hampered seriously. In addition to supplying meals for the men engaged in the arduous forms of special service developing from the flood conditions the company has also had to supply for a week or more good drinking water for its employees. A number of wells and springs in the city have been used for this purpose, not only by the company, but by the inhabitants of Indianapolis generally. Warnings against the use of the usual supply of water for drinking or cooking purposes unless it was boiled were issued by the city health department and the water company.

The interruption of service to the company was complete for only a very short time, although, of course, conditions at the end of a week were still not normal. After the complete stoppage of service on March 25 the company was able to resume in an hour or two partial operation on the Irvington city line. The power for this purpose was received from the Philadelphia power plant of the Indianapolis, Terre Haute & Eastern Traction Company. On March 27 the company was able to start a two-hour service on some lines and also began to make a beginning on some of the other lines. Cars were added to the service gradually until on March 30 the number in operation was up to seventy.

During the height of the flood conditions business in the city in many instances was suspended while in others only part of the usual volume was continued. All the cars that were operated, of course, carried heavy loads, and automobiles and wagons of every type were used to transport the crowds. As the heat and other facilities in many office buildings were discontinued, little business was done that



Flood Disaster—Meridian Street Bridge in Indianapolis, with Street Railway Feeders Left Intact

was not necessary. A number of the steam railroads were able to operate trains into the suburban districts and thus take care of part of the demand for transportation. They were able to do this because they could not operate through service. The condition in Indianapolis on March 31 was that about one-half of the number of cars operated on the regular schedule, not counting the tripper service, were in operation on the city lines.

CONDITIONS ON THE T. H., I. & E.

Some indication of the conditions under which the interurban lines of the Terre Haute, Indianapolis & Eastern Traction Company labored may be obtained from the following brief statement of the conditions on March 31 as stated in Indianapolis. It was believed then that the Northwestern line reaching to Lafayette would be able to operate to Indianapolis on that day. Operation between Crawfordsville and Lebanon was started on March 27. The line between Crawfordsville and Indianapolis continued operation without interruption between the former city and the outlying part of the capital city. The line between Indianapolis and Danville, Ind., was operated to the Indianapolis city limits on March 31. The line between Indianapolis and Terre Haute was operated on March 31. Conditions on the Martinsville line made it seem probable that service as far as Mooresville would be commenced by April 2 or 3 and to Martinsville by the latter part of the present week. The abutment of one bridge on this line was cracked on the corner. The abutment of another bridge went down and the bridge dropped, but the company thinks that this bridge can be put up. The eastern line of the company was in operation between Indianapolis and Knightstown on the western end and between Richmond and

instances that sections of track have completely disappeared.

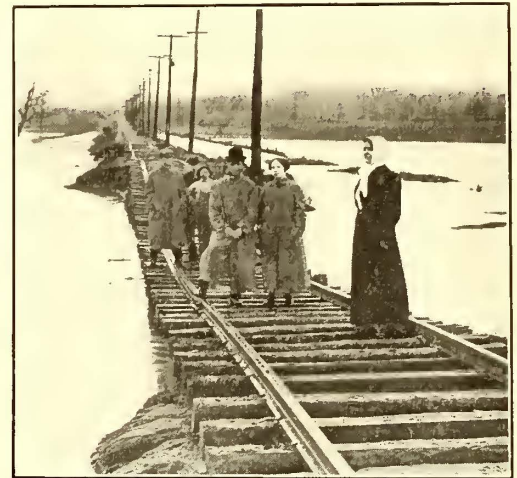
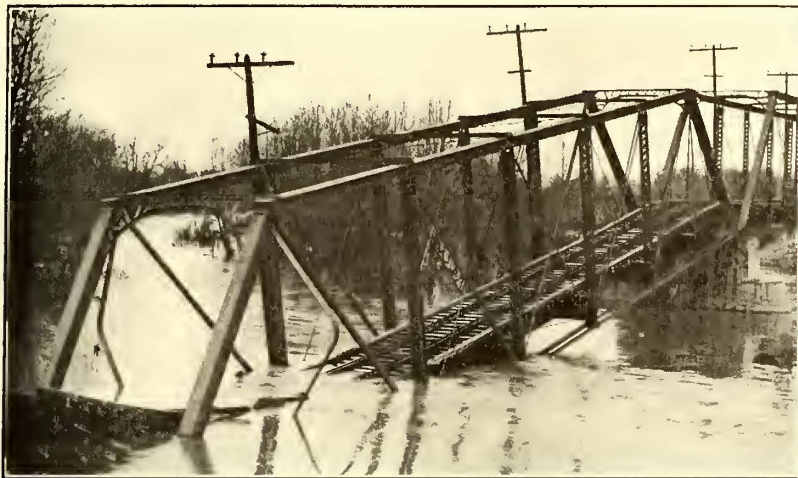
FLOOD DAMAGE THROUGHOUT INDIANA

T. C. McReynolds, of the Kokomo, Marion & Western Traction Company, telephoned Governor Ralston of Indiana on March 26 asking for permission to take blankets belonging to the Kokomo members of the State militia to Peru, where many survivors of the flood were suffering from cold weather. The Governor promptly gave permission to do this.

The Indianapolis *News* of March 27 said that one of the heroes of the flood was Jack Abbott, local superintendent of the Fort Wayne & Northern Indiana Traction Company at Lafayette, Ind., who for the previous forty-eight hours had been standing on duty at the South Street power station endeavoring to keep the plant in operation. This was the only source of light and power in Lafayette and Mr. Abbott and his men endangered their lives to keep it in operation. They built dams and wells in order that operation might be continued.

The Indiana Railway & Lighting Company of Kokomo, Ind., according to a dispatch published in the Indianapolis *News* on March 31, estimates its loss at about \$100,000.

The Winona Interurban Railway Company reported from Warsaw, Ind., that its loss consisted of whatever damage



Flood Disaster—Views on Martinsville Division of Terre Haute, Indianapolis & Eastern Traction Company

centerville on the eastern end. The Richmond city line continued in operation without interruption. The Terre Haute city line discontinued operation for a part of one day. The line in Brazil continued in operation except for the same part of a day. The line extending to Clinton from Terre Haute was in operation almost as far as Clinton. The bridge at Clinton over the Wabash River did not go out, but the trestle will have to be filled in. The line between Terre Haute and Paris, Ill., was broken on account of the Wabash River flood. It was opened from Paris to the Wabash River valley, but could not get through the flood to Terre Haute. The line between Terre Haute and Sullivan was in operation.

The worst conditions which confronted the company were those that resulted from the flooding of the two power houses in Indianapolis and arose mainly from the interruption of service and the consequent inability to make normal gross earnings. No bridges on the interurban lines of the company were absolutely out, although, of course, some of the city bridges on which cars are operated at Indianapolis were carried away by the force of the water.

So far as conditions can be judged at this time, it is believed in Indianapolis that the loss to interurban lines will not be nearly so great as to the steam roads, either in damage to physical property or in loss of earnings while service was crippled. The full extent of the loss, however, cannot be determined for many weeks. It is reported in some

was sustained by four motor cars which were caught by the flood in Peru and submerged for three or four days. There were also a few washouts which will require a small amount of track work. The damage was slight compared with that to the other two traction lines entering Peru.

The Toledo & Chicago Interurban Railway experienced but little difficulty except that for several days its cars were unable to reach the passenger terminal in Fort Wayne, owing to the flooded condition of that city at that time. Bridges over the Wabash River at Peru and Logansport, Ind., one used by the Union Traction Company of Indiana and the other owned by it, gave away before the flood, cutting off both these lines from their northern terminals. The financial loss in both of these instances will include not only the loss of the two structures but that from the cessation of traffic during the time required to replace the bridges.

Service on the Fort Wayne & Northern Indiana Traction Company's lines was seriously interrupted by flood conditions along the St. Mary's and Wabash Rivers. Local street railway service in Fort Wayne was abandoned March 25 on Nebraska and South Calhoun Streets, and interurban service to Logansport and Decatur, Ind., was abandoned owing to a number of washouts. The flood conditions prevailing in this district, however, did not affect interurban service between Fort Wayne and Bluffton.

Reports from Fort Wayne also advise that the traction

company has rendered assistance to the flood sufferers by supplying the rescuers with boats obtained from a summer resort on one of its lines. There was no interference with the generating station, which not only carried its own load but, beginning March 25, supplied energy to the city's arc lamps, the municipal plant being out of service on account of the flood. The traction company also agreed to take over as many of the city's power customers as it could carry.

The Indiana Railways & Light Company reports that on the lines of the Kokomo, Marion & Western the power plant was forced out of commission at noon on March 24 and was not able to resume operation until Saturday afternoon, March 29. The damage was not great except that the machinery was wet and very muddy and required considerable cleaning. Only one bridge went out on the entire interurban line. The interurban cars suspended operation for about three days and the city lines but one day. The loss will not exceed \$25,000 on the entire system.

MAINTAINING POWER SUPPLY AT MARION, IND.

An interesting account of the flood is given in a letter to the American Gas & Electric Company from O. M. Drechsel, of the Marion Light & Heating Company, which furnishes power to the Marion, Bluffton & Eastern Traction Company. An abstract of the letter follows, the plant referred to being shown in one of the illustrations as it appeared after the flood had fallen 22 in.:

"Tuesday morning at 1:30 the water was 22 in. high over our turbine room floor. All of the boiler room was under water and it got up within 1 in. of the grates. We had to bank our fires and close down everything with the exception of the spare circuit, keeping on just enough power to give us lights so as to operate the pumps that were pumping the water out of the pit in the turbine basement.

"By operating three of the pumps in the basement we were able to hold our own for a time. We built cofferdams around the openings leading into the boiler room and



Flood Disaster—Power Station of Marion Light & Heating Company After Water Had Receded Two Feet

Between Louisville and Indianapolis the Indianapolis, Columbus & Southern Traction Company, operating between Seymour and Indianapolis, suffered the most damage, its system being put entirely out of commission for several days. Operation between Indianapolis and Franklin was commenced on March 31. The Indianapolis & Louisville Traction Company was compelled to cease operation completely for forty-eight hours and subsequently maintained a regular schedule between Louisville and Seymour, although its service between Seymour and Columbus was badly interfered with because of the torn-up tracks.

The Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company, connecting Louisville with New Albany and Jeffersonville, Ind., and thence connecting with Sellersburg and points farther north, suffered but little from storm violence and floods.

also around the south and west doors of the plant, but finally, even with the three pumps, we began to lose ground. As a last means we broke an elbow on the No. 4 circulating pump suction and made a connection for a 4-in. pipe discharge at a hand-hole of the condenser and with this outfit in operation we were able to keep the water at a standstill.

"When the water was at its highest the south wall of the basement sprang a leak and water was pouring in at the rate of 500 or 600 gal. per minute. Two of the men with their arms succeeded in keeping this back until it might be plugged with rags and clay. About this time the firemen reported that the water was reaching their fires and that the drafts were entirely covered. We thought within the next fifteen minutes we should be entirely at the mercy of the water. We banked the fires and opened the fire doors, receiving what little draft was possible through them, and by operating only the spare circuit with what auxiliaries

we had in our plant we were able to run in this condition until about 2:30, when the water was at a standstill. At 3 o'clock the water had fallen about $\frac{1}{8}$ in. and we knew if we could hold out a little longer the victory was ours. By 6 a. m. Wednesday we had about 2 in. of draft space under our boilers and were gaining ground. The river began to fall very rapidly and by Wednesday night only 6 in. of water covered the boiler room floors."

INDIANA UNION TRACTION COMPANY

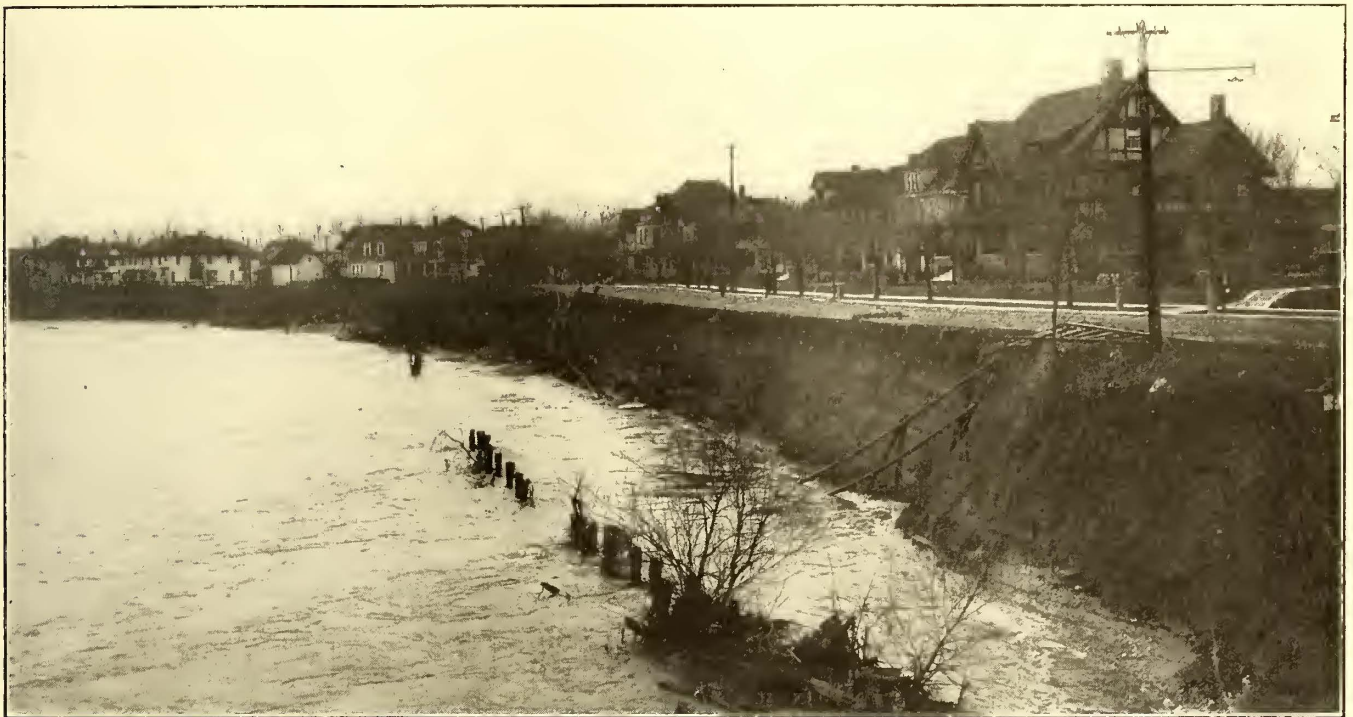
The lines of the Union Traction Company of Indiana extend in various directions, crossing many rivers and streams that were flooded and therefore were affected in many points. The statement, made officially, however, at the headquarters of the company, Anderson, Ind., on the morning of April 2, showed that with the exception of the line extending between Anderson and Middletown inter-urban service had been resumed. Except for possibly the line between Anderson and North Anderson and two lines in Muncie, the city lines had continued in operation without difficulty.

Interruption in train service was due entirely to washouts.

force with which logs and debris were propelled against it. This was straightened and proper foundations were built and the bridge placed in service again on March 27.

The Muncie-Union City line had numerous washouts, particularly at Union City, where Farmland and Selma Park, owned by the company at Muncie, were completely inundated and some of the buildings were badly damaged. The loop on which cars are turned at this point was entirely washed out. At Eaton there was an extensive wash-out and another bridge was disabled. At Hartford City one bent of the bridge was washed out. At Montpelier a latticed deck bridge with two spans of 60 ft. each was washed off the abutments and went into the river. It was expected that this bridge would be in place by April 5. At Pendleton, on the Muncie-Indianapolis line, the track just east of the abutment of the bridge was badly washed out. This has been repaired. One end of the bridge over the White River at Chesterfield dropped into the river. This bridge was repaired temporarily and raised so that operation could be resumed.

At Anderson the track on the North Side, extending



Flood Disaster—Washed-Out Tracks of the Union Traction Company of Indiana in the Outskirts of Indianapolis

Except for power plants at Eaton and Winchester, which were closed down on account of high water, no difficulty with power houses was experienced. In neither of these two plants did the water reach the engine room. It got into transformer rooms and up to the rheostats of generators, practically forcing suspension. Even if these plants had been in operation cars could not have been run on the lines which they serve on account of washouts. Condensing apparatus in the Newcastle plant was apparently disabled on account of difficulty with a motor-driven pump. The pump is now all right and the station was not shut down.

The washouts on lines were complicated by trouble with bridges. Three reinforced concrete bridges on the Newcastle line caused trouble as the water undermined the grade back of the abutments and under foundations of the piers. A bridge on the Muncie-Union City line was thrown out of alignment by the failure of the city bridge above it. This bridge was not knocked off the abutments and was put in service on the third day after the accident. On the Whiteley line a bridge was thrown out of alignment by the

around the freight house, and also the connecting lines between Muncie and Indianapolis and the Anderson-Marion lines were washed out. The track north of the White River bridge was badly washed out. There were also bad washouts at Alexandria, Summitville, Fairmount, Gas City and Marion. At the last point the company uses the county bridge, the center abutment of which was washed out, thus causing interruption of traffic between Anderson and Indianapolis. The track was also washed out for the entire section between Twenty-seventh and Thirtieth Streets, Indianapolis. In this case new temporary track was built in a night and day on adjoining streets, the track being laid directly on top of pavement.

At Broad Ripple there were two large washouts. One piece of bridge in the center of the river was undermined so that it leans quite badly and operations are suspended at that point. A temporary track about $\frac{1}{2}$ mile long was built across the county bridge in three days. South of Noblesville 2500 ft. of grade 25 ft. high was washed out. North of Noblesville about 3000 ft. of grade of the same height was washed out and the track had to be moved back to

the adjoining cornfield. About $\frac{3}{4}$ mile of track south of Peru was badly washed out and placed afloat. At Peru the company bridge paralleled the county bridge, and when the latter went out it carried the company bridge also. This was a through-plate girder bridge with five spans of 60 ft. each, all of which are at the bottom of the Wabash River. One cement pier was also lost. The company is now working on this bridge. At Lincoln the abutments of one span plate girder bridge were undermined and damaged so badly that the bridge cannot be used. The company is repairing it. About 250 ft. of 30-ft. grade at Logansport was washed away and one span of the steel bridge thrown into the river by the undermining of one pier. In addition to the more serious locations mentioned there were any number of small washouts. The station at Peru used jointly with the Chesapeake & Ohio Railway had 8 ft. of water. The water was also 8 ft. high in the interurban station at Logansport.

The overhead work did not suffer very badly except at Broad Ripple, Noblesville, Peru, Logansport and other points where the grade was lost. At these places poles were down and wires tangled. When trouble with bridges was seen to be serious the company laid plans for repair as quickly as possible. Gangs of men were secured from the Indianapolis Bridge Company and the company's own forces were thus supplemented. At one time men were repairing bridges at eight different places. A pile driver was built in the Traction Company's shops in four days. At Noblesville the bridge will be raised 4 ft. and at Peru 1 ft. A new bridge will be built at Montpelier.

The first news of serious washouts began to reach the office of the company by telephone on March 24. This was followed during the night by frequent reports of difficulty due to subsequent culmination of flood conditions. As in the case of other companies, small streams that had been practically unheard of became raging torrents. The endeavors of the company were bent toward the protection of the bridges and the restoration of normal physical conditions. The officials of the company worked in whatever places their services were most needed. General Manager Nicholl remained in Anderson and was able to keep in close touch with different parts of the system, as the company's telephone lines remained generally in operation. Where these lines were down, communication was established by means of commercial telephone systems. The officials hunted up labor and worked with track and bridge men. An example of this is shown by the fact that G. W. Norveil, general passenger and freight agent, acted as foreman of a section gang. The trainmen and shop employees also worked on bridge and track gangs. The superintendents put in their time in the same way. The linemen gave splendid service, although their work was affected because of the damage done by heavy wind. Great credit was given by the general manager to all employees. An illustration of the work of the men is shown by the fact that the shopmen at Muncie went to Whitely Bridge to protect it from floating timber. One unfortunate man engaged in this work lost his balance, fell in the river and was drowned. Another man employed by a contractor on the Newcastle line lost his life in the same way.

CONDITIONS ON THE INDIANAPOLIS & CINCINNATI TRACTION COMPANY

BY CHARLES L. HENRY, PRESIDENT

The Indianapolis & Cincinnati Traction Company has two lines extending in a general direction east and south-east from Indianapolis. One extends through Rushville to Connersville, a distance of 58 miles almost directly east from Indianapolis, and the other extends in a southeasterly direction through Shelbyville to Greensburg, a distance of 49 miles. The power house is situated at Rushville, and the principal shops and carhouse are also located at that point.

At Rushville the Flat Rock stream overflowed, backing the water up into the town around the traction company's shops 2 ft. deep. The water was 42 in. deep in the power house basement, shutting down the plant and thoroughly soaking the motors of all of the cars in the yards. The turbines, engines, transformers, exciters, etc., were on the upper floor of the engine room and were not reached by the water, the only electrical operating machinery reached by the water being the motors driving the coal crusher and the coal elevator, so that no other damage was done in the power house except the shutting down of the plant.

The flood reached the property of the company at Rushville about midnight on the night of Monday, March 24, and the plant was then entirely shut down, leaving the cars scattered out at different points over both divisions. None of the cars outside was damaged in any way and, with the exception of seven cars in the yards at Rushville, the motors of which were wet, the rolling stock of the company is wholly uninjured.

Just as soon as the water abated and the dirt in the basement of the power house could be cleaned out, the power house was ready to start up, and even the motors operating the coal apparatus, as soon as dried out, were found to be in operating condition. The water commenced falling about noon on Tuesday, March 25, and then rapidly receded. The coal-operating motors were dried out with blow torches, and it was not necessary to remove them from their installation.

On the morning of Thursday, March 27, the power house was ready for operation, and that afternoon the company began to get work cars out for repairs on both divisions. As it was known that trolley and transmission poles were down at various washouts, the company was careful not to turn on power in any transformer section until the linemen were within reach of it. Following this plan, by the middle of the afternoon of that day, the company had tested out and had the power ready for use on the entire Rushville section. By noon of the following day it was ready on the Shelbyville section.

It was found on examination that the bridge over Blue River near Morristown on the Rushville section, about 20 miles out from Indianapolis, was damaged, one pier being undermined and crumbled and one abutment leaning over and almost falling into the water. Except for this, there was no trouble with bridges on the Rushville section, but there were several washouts of the track requiring attention before any cars could be moved, the most serious being near Rushville and about 5 miles west of Connersville. At neither place, however, was the grade seriously disturbed.

On the Shelbyville division the bridge over Swamp Creek, about 6 miles west of Shelbyville, had both abutments washed out, and the bridge over Brandywine, about a mile east of Shelbyville, had the west abutment undermined, but in neither case was the steel work down in the water, as it was left supported by the crippled masonry. The water washed around both abutments of the bridge over Blue River in the suburbs of Shelbyville, but did not injure the bridge.

About three-quarters of a mile west of Shelbyville the waters of Blue River washed through a 20-ft. embankment of the Cleveland, Cincinnati, Chicago & St. Louis Railway and across the traction company's lines, washing out about 200 ft. of the grade on both the stream and the traction line. In addition to this, several small culverts and bridges were washed out within the section between Fairland and Shelbyville, and the track in numerous places had the gravel washed off, and in some instances part of the grade. None of these, except the special cases above noted, however, was significant as of a serious character.

Nearly all of the damage on this division was occasioned by the very heavy flood on Blue River, which runs immediately through the suburbs of Shelbyville. It was this that caused the cutting out of the embankment of the Big Four

road and the traction lines near there. About 7 miles above Shelbyville, at the little town of Freeport, a dike was cut which allowed the water from Blue River to flow down in an almost southerly direction into the two streams of Brandywine and Swamp Creek, carrying an immense flood of water down both of these streams, which caused the washouts of the two bridges above mentioned. About a mile above the traction company's line, just before this flood of water reached Swamp Creek, it had washed a channel like the bed of a regular stream of ten times the size of the ordinary creek into which it was flowing. No such amount of water was ever known in this territory, and it came sweeping down these small streams, cutting out the Big Four bridges and the traction company bridges wholly unexpectedly.

The cars that were left out at various points on the line on account of the storm were brought into the carhouse as soon as the small repairs on the tracks could be made to enable this to be done. On April 2 no cars went out of the carhouse except those that were on the Indianapolis end, cut off from the shops at Shelbyville and the shops at Rushville.

Work was commenced immediately to put the property in order. As soon as a pile driver could be secured, work

and but little to any of the car equipment. All of the serious damage is centered at the Blue River bridge on the Rushville division and the washouts between Fairland and Shelbyville, a distance of 6 miles. All other damage is of an inconsequential character.

IN NEW YORK AND PENNSYLVANIA

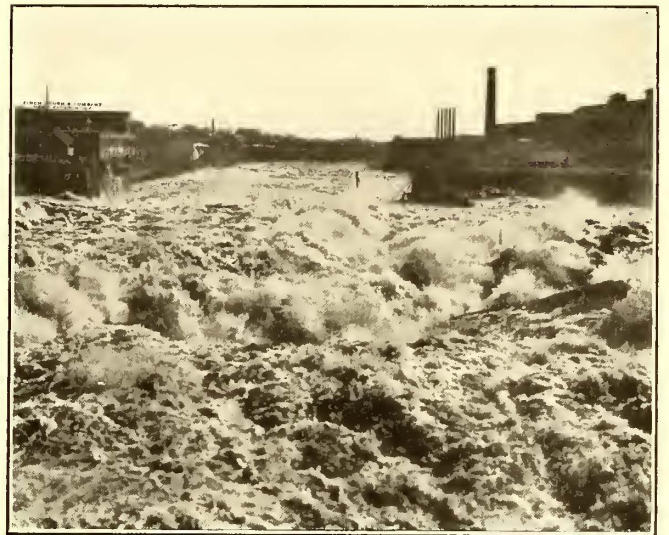
The Citizens' Traction Company, of Oil City, which comprises 35 miles of track, experienced several slides and washouts. During high water the general manager, W. W. Cole, had all dangerous points patrolled day and night. Service was temporarily interrupted at certain points, but passengers were transferred around these points. The power station was kept in service although the flood was at one time within 6 in. of the windows.

Norman McD. Crawford, president of the Mahoning & Shenango Railway & Light Company and other subsidiaries of the Republic Railway & Light Company, states that the direct damage to the property will be less than \$6,000.

On the lines of the Elmira Water, Light & Railroad Company two small sections of track were submerged but there was no serious interruption to the service. The latter was also true on the Fonda, Johnstown & Gloversville Railroad.



Flood Disaster—Hudson River at Glens Falls, N. Y., Showing Bridge Before Its Collapse



Flood Disaster—Hudson River at Glens Falls, N. Y., After Collapse of Bridge

was commenced on repairing the Blue River bridge near Morristown, and, with reasonable success, this will be completed in time for cars to pass over it on Saturday morning of this week (April 5), when service can be resumed over the entire Rushville-Connersville division.

On the other division it will take perhaps ten days longer to repair the bridges between Fairland and Shelbyville, and until this is done not much can be done in the way of service on that division; but about the time the service is begun on the Rushville division, partial service will be commenced on the Shelbyville division between Indianapolis and Fairland on the one end, and between Shelbyville and Greensburg on the other. It was impossible to secure more than one pile driver. In fact, we were fortunate to get that one, as the railroad companies immediately picked up all that could be secured in any way.

All in all the damage to the property is much less than we supposed it was and very much less than a person could believe possible in looking over the territory and seeing the vast amount of water that came down the streams.

Looking over the field, the company is to be congratulated upon the fact that no one was injured, no cars were derailed, no injury resulted to the power house and machinery

The Western New York & Pennsylvania Traction Company reports that traffic was interrupted on the Bolivar, Local, Allegany-Salamanca and Bradford-Carrollton divisions for about twelve hours, but no interruption to the supply of power occurred. No serious delays occurred on the Beebe lines.

The Otsego & Herkimer Railroad Company reports a few minor washouts only, although the storm established a record for high water and caused extensive damage to highway bridges and roads throughout the district. The company's service was interrupted for one day only.

The Hudson Valley Railway, Glens Falls, N. Y., experienced some interruptions to its service from the flood. On the line between Stillwater and Schuylerville the water from the Hudson River covered the tracks beginning Tuesday afternoon, March 25, necessitating the withdrawal of service between these points. From Tuesday until Friday the water reached a depth of from 1 ft. to 5 ft. on the tracks. On Saturday it began to recede and on Monday the company was able to have the tracks repaired by the section men preparatory to resuming service on Tuesday, April 1.

On Thursday the highway bridge spanning the Hudson

River between the city of Glens Falls and the village of South Glens Falls was carried away, owing to the very high water conditions and the floating of thousands of logs which piled up against the substructure of the bridge. The carrying away of this bridge stopped all through traffic between Glens Falls, Saratoga and Albany and is the most serious of all the trouble which occurred on the line. Arrangements are now being made for the construction of a temporary footbridge, which will probably be completed in ten to fifteen days, after which the company will be able to transfer passengers over the Hudson River at the point in question until such time as a permanent structure is erected and the cars are able to cross.

On Thursday afternoon the company's Mechanicsville power house (steam plant), which is the main source of supply for all the company's lines, was compelled to shut down owing to water in the engine room. The load was kept on while the water was rising and the power was not shut off until a depth of about 3 ft. was reached. This failure of the power shut down all ears except two local cars operating between Glens Falls and Fort Edward. The supply of power for these was generated in the company's Middle Falls water power plant, which is over 20 miles from Glens Falls. The current was transmitted over the high-tension lines at 22,000 volts to the Glens Falls substation. The operation of this power plant furnished sufficient power for the lighting of the company's earhouses, shops and substations and for other lighting over the system.

As in Albany, the most serious loss to the Hudson Valley Railway Company from the flood will be the loss of revenue from the non-operation of cars, especially in this instance, the operation of through ears from Glens Falls to Albany via Saratoga. The actual property damage will not represent very much for the reason that the principal expense involved was the replacing of ballast, etc. Of the two accompanying engravings, one shows the river bridge at Glens Falls on the afternoon of Thursday before it was carried away. The other is from a photograph taken early Friday morning, the bridge having gone out at 10 p. m., Thursday.

The Mechanicsville power plant was able to take up the entire load at 9 o'clock Saturday morning, having been shut down from 4 o'clock Thursday afternoon. Subsequent to Saturday the company was able to operate cars on all of its lines except between Schuylerville and Stillwater, where the water was too high to permit operation with safety.

THE SITUATION IN ALBANY AND SCHENECTADY

There was no interference with the Schenectady Railway from the high water last week, but the properties of the United Traction Company at Albany and Troy suffered some inconvenience. On the evening of March 23 the rising water of the Hudson got into the Adirondack power plant and cut off the supply of power from all of that system except at Schenectady. The management had been watching developments and promptly put into service the steam plant of the Delaware & Hudson Company at Mechanicsville, which supplied power to the system until 11 a. m. Thursday. In the meantime the line department had strung 1000 ft. of feeder between the end of the Schenectady power supply and the Albany power supply, so that when the steam plant had to shut down Thursday morning from rising water it was possible to continue the operation of more than one-fourth of the Albany ears and all of the interurban cars between Albany and Schenectady, although the system in Cohoes and Troy was out of service. By March 25 at noon the Adirondack Power Company was able to connect up the Schaghticoke water power station with the Adirondack plant. It was then possible to put in service practically two-thirds of all the ears on the system. On Saturday the water went down sufficiently to permit the company to use its transformer stations. No water had entered the transformers, but the blowers, which were on a lower level, were flooded.

THE OMAHA AND TERRE HAUTE TORNADOES

The tornado which struck Omaha at 6 p. m. on Sunday, March 23, inflicted a loss of no small amount upon the Omaha & Council Bluffs Street Railway, but on the whole the company came out of the disaster in remarkably good shape. The storm wrought its havoc diagonally across the city, coming from the southwest. It cut a swath from three to six blocks wide, and the distance traversed over the city measures about 5 miles. Eight lines of street railway were in its direct path. Ten cars on these lines were caught and were more or less damaged. The accompanying photographs will give one a fair idea of the damage done to the rolling stock. The loss on this item is estimated to be about \$5,000.

The greatest loss suffered by the company was in its overhead construction. Several miles of this was completely wrecked; wooden poles were broken and iron poles were bent to the ground. Trolley wire, feeders, telephone wires and light wires were all down in one mass. The company estimates the loss on this item at \$15,000. Fortunately, the power station, substations and all four earhouses were outside of the tornado's path. The only building belonging to the company that suffered any damage was one of its shop buildings. This damage, however, was but slight and is estimated at \$2,000.



Omaha Tornado—Corner of Thirty-third Street and Cumming Street

Before striking Omaha the tornado was seen to split, and a portion took an easterly course, crossing the Missouri River and striking Lake Manawa, a beautiful summer resort owned by this company, which is situated south-east of Council Bluffs and about 8 miles from Omaha. Considerable damage was done at the park. A dance pavilion recently erected at a cost of \$17,000 was badly damaged, and a large restaurant building, together with several smaller buildings, was badly wrecked. All fences and many beautiful shade trees were destroyed. The park is leased to H. M. Barnet, formerly of St. Paul, Minn., and it is planned to have it in readiness again for the coming summer season. The damage at Lake Manawa is estimated at \$10,000.

The matter of loss of and damage to its property was, however, of secondary consideration with the management of the company. Its first thought was the restoration of service on the many wrecked lines. Of course, when the tornado struck the city the entire system was paralyzed in an instant. Miles of track had to be cleared of huge piles of debris—wrecked buildings, trees, poles, etc.—and miles of overhead had to be rebuilt.

Every man in the employ of the company who was able to do so reported for duty immediately after the storm. R. A. Leussler, the assistant general manager, after making a hurried survey of the situation, issued orders to first

open one line to each section of the city, and by Monday morning there were cars running to each section of the city. By Wednesday evening practically normal service had been restored on all lines.

Owing to the fact that the city was in utter darkness, without telephone service and with but meager means of transportation, the company was greatly handicapped in its work. But with the loyal response and faithful work of its men wonderful progress was made the first night.



of the less fortunate ones. They have a relief subscription list well on its way for the purpose of helping to place on their feet again all those of their fellow-employees who were victims of the tornado, and it has been intimated that the officers and directors of the company intend to swell this relief fund materially. The company has already paid \$5,000 into the general relief fund.

The dead in the city as a result of the tornado will number about 150, the injured about 500 and the homeless about



Omaha Tornado—Cars Overturned by the Wind

A drop in temperature on Monday, followed by a driving snow on Tuesday, came as an afterclap, adding a further handicap to those engaged in the work of restoring the lines for service and increasing the suffering of the hundreds of victims of the storm.

The company, however, was extremely fortunate in having a liberal supply of poles and other line material on hand. This material had been purchased since the first of the year for replacements and new construction work scheduled for the current year. Additional material was also rushed to Omaha from other cities. Of course, a great deal of the work done is necessarily of a temporary

2000. The property loss in the city of Omaha is estimated to be about \$5,000,000.

THE STORM IN TERRE HAUTE

On Sunday night, March 23, a destructive tornado also passed through the west-central part of Indiana, striking the neighborhood of Terre Haute, Brazil and Greencastle. Its path was in a northeasterly direction. About twenty persons were killed at Terre Haute, and probably 200 injured, and nearly 300 houses were wholly or partly wrecked. The probable property loss in that neighborhood is nearly \$1,000,000. Only three places in Indiana were struck by this tornado, which descended near Prairietown about 9



Omaha Tornado—View on Street Showing Complete Disappearance of Trolley Wire and Trolley Poles

character and will have to be done over again. It will probably be a month or longer before the permanent reconstruction work has been completed.

Among the employees of the company, one was killed in the tornado (his wife was also killed), five were injured and forty-four lost or sustained more or less damage to their homes. Many of the men who lost everything they possessed in the world nevertheless worked straight through, day and night.

Those of the employees who escaped injury to person or damage to property lost no time in coming to the help

p. m., and then passed on to Terre Haute, taking a path through the open country to the northeast, and vanished about 10 o'clock.

A large amount of damage was done to the street railway system not only on account of broken cables and trolley wires, but also on account of the wrecking of a number of cars. Immediately after the windstorm rain commenced to fall and before the railway company could repair the damage from the cyclone several of its lines were under water and service on the system was partially suspended on account of the flood.

MR. SERGEANT ON PROPOSED NINE-HOURS-IN-ELEVEN BILLS.

Among the most important measures under consideration at the present session of the Massachusetts Legislature are the so-called "Nine-Hours-in-Eleven" bills (House 588 and House 1373), providing that the day's work of motor-men and conductors shall not exceed nine hours' service performed in eleven consecutive hours. The supporters of these measures are identified with the Massachusetts Branch of the American Federation of Labor, and the hearings have been held before the legislative committee on street railways. The bills have been opposed at the hearings by practically every street railway in the State. Among the street railway executives who appeared before the committee was C. S. Sergeant, vice-president of the Boston Elevated Railway Company. An outline of his testimony is given below.

Mr. Sergeant reviewed the history of Massachusetts legislation bearing upon the hours of employment of motor-men and conductors and stated that since entering the street railway field in 1888 he had always been informed that it was for the interest of the extra man to have his trips put together in such a way that he knew what he had to do every day. That could not be done without making a long day, and in the early times there is no question that some of the days were excessively long. In 1894, when the ten-hours-in-twelve law was passed, the operating officers were advised by counsel that the swing extra and regular extra cars must be eliminated and a circular announcement was issued to that effect. Scarcely anything ever stirred up the employees so much at Boston as the issuing of timetables without any swing extra or regular extra cars. Mr. Sergeant then submitted a chart illustrating the variable demands of the public at different hours for traffic accommodations. On the Boston system the company has 1310 surface cars in service between 7 and 8 a. m.; between 8 and 9 a. m., 966; between 10 and 11, 621. Somewhere in the valley of the curve lies a chance to make regular cars that will extend over enough hours, but it cannot be done on the peaks. The business day of an electric railway is not an eleven-hour day, and it cannot be made so.

Mr. Sergeant then outlined the difficulties of working out a schedule in harmony with the proposed law, pointing out that it would soon result in a typical case in operating many cars practically empty upon the street, giving an excessive service and creating needless noise and dust in the highways.

When the present nine-hours-in-twelve law went into effect on Jan. 1, 1913, the company faced the condition that its men were going to do one-tenth less work and the company realized, more forcibly than others perhaps, that what the men really wanted of the Legislature was the former day's pay for a shorter day. The company announced its intention to accord this and to allow overtime pay for any platform time over nine hours. The company established payment by the hour instead of by the day as formerly, because it was a general custom throughout the country. A study of the payroll showed that few extra men earned more than the guaranteed minimum pay of \$12, and it appeared fair to put extra work on the straight rate per hour along with other work so long as the guarantee was left. Except in a few instances, the change to payment by the hour has not reduced wages, as the company increased the rate per hour to offset the decrease in the number of hours required for the maximum day's work, and it also agreed to pay overtime for anything exceeding nine hours, the present law recognizing the right to lay out days not exceeding nine and one-half hours. A very few cars, running under eight and three-quarter hours, have lost one-quarter hour's pay. The present law cut the outside time of regular extras to a maximum of sixteen hours. The average length before Jan. 1 was sixteen hours and twenty-

nine minutes, and the average of regular extras by the present tables on the Boston system is fourteen hours and fifty-six minutes.

Mr. Sergeant said that among the objections to the present law voiced at the hearing is that the twelve-hour limit does no good, because the men have to be on hand. The company assumed that the Legislature recognized the fact that it could not get its morning and evening traffic peaks into a period of less than twelve hours. With 1310 cars leaving between 7 and 8 a. m. and 1423 between 5 and 6 p. m. the work is laid out so that all the men will be available at these times. The company's men were not all available before on account of the starting of regular cars in the morning. A change was made to get all the men available for both peaks, and that necessarily pushed the regular cars down a little later in the day.

The advocates of the bill testified that many men formerly working on regular cars have been obliged to take the extra cars as a result of the foregoing change. Mr. Sergeant said that the proportion is small and stated that in December, 1912, the company had 1046 regular cars and that it now has 998. Of the regular extras the company has 457, or 130 more than in December, and of trippers 361, or 230 less. The net result is 148 less runs on the winter timetables. The service needed in December is different from that required in January and February, and only forty-eight of the decreased trips came out of the regular cars. At present 63 per cent of the trips are run by regular cars at Boston, and they are run by 55 per cent of the crews; 27 per cent of the trips and 25 per cent of the crews are regular extras, and 10 per cent of the trips and 20 per cent of the crews are trippers. The inference is that the company has made up more of the tripper work into regular extra work, so that more men are getting paid for a full day than formerly, there being 230 fewer trippers and 130 more regular extras. Such practice tends to alleviate the evils of the extra list, which is the bane of everybody, and Mr. Sergeant said that the sooner the man is put on the regular extra list the better off he is, even if the day is stretched out to sixteen hours, which is an entirely humane day for that kind of work in that kind of business. The more the outside limit is shortened the fewer regular cars the company can have.

Presenting the application of the proposed nine-hours-in-eleven act to a typical timetable, Mr. Sergeant cited the Allston-Park Street subway line via Beaver Street, Route 905, which under the present arrangement has eight regular crews, two regular extras and seven morning and afternoon trippers. In applying nine hours in eleven to it the line has seven regular cars; all the regular extras are lost, and the trippers are increased from seven to fourteen. The net result is that four more sets of men are required, with less pay for each, on the average. At present on the Boston surface system 68.4 per cent of the full day's work comes within an outside limit of twelve hours, and 28.8 per cent outside of fourteen hours and under sixteen. The trippers are not included in these figures. The total number of platform men on the regular schedule has decreased from 5290 to 5227 since December. The proposed law would mean a large increase in a number of men working a few trips, and that would mean either that the men cannot make a reasonable earning or that the company cannot hold them because they cannot earn enough and has got to give a guaranty. The company cannot afford to give a guaranty of \$12 a week to a man making only one trip a day. It is not in the public interest to hold a lot of men idle most of the time or to make the business of street railroading unduly expensive. At present, with all the large high-speed cars running on the Boston surface and elevated lines, the company is carrying only three more revenue passengers per half trip than it carried in the horse car days. It is probable that the number of crews would have to be increased 12½ per cent if the law were passed.

PACIFIC COAST ELECTRIC RAILWAY ASSOCIATION

(By Telegraph)

Pursuant to a call signed by F. W. Hild, general manager Portland (Ore.) Railway, Light & Power Company, following a conference of electric railway men held in December last, about forty representatives of the electric railways of the Pacific Coast States of California, Oregon and Washington met at San Francisco March 31 and April 1, 1913. The purpose of the meeting was to organize an electric railway association of these three States. A. W. Leonard, vice-president and general manager Puget Sound Traction & Light Company, Seattle, was made chairman, and Thomas Finigan, purchasing agent United Railroads of San Francisco, secretary of the meeting. Following a full discussion as to the reasons for the proposed association, the following resolution was unanimously adopted:

"Resolved, That all companies or corporations engaged in the electric railway business in the three Pacific Coast States of California, Oregon and Washington shall be eligible for full membership in the Pacific Coast Electric Railway Association, and in case the Pacific Coast Electric Railway Association becomes a section of the American Electric Railway Association that its members may also become member companies, if they are not so already, of the American Electric Railway Association."

A committee was appointed on constitution and by-laws and another committee on nominations of officers. At the session held April 1 the following officers were elected: President, F. W. Hild, Portland; first vice-president, T. T. C. Gregory, president Vallejo (Cal.) & Northern Railway; second vice-president, A. W. Leonard, vice-president and general manager Puget Sound Traction, Light & Power Company, Seattle; treasurer, Norman Logan, secretary and treasurer Northern Electric Company, San Francisco; temporary secretary, Thomas Finigan, San Francisco. Executive committee: president, vice-president, W. E. Dunne, vice-president Los Angeles Railway; Paul Shoup, president Pacific Electric Railway; Charles N. Black, vice-president and general manager United Railroads of San Francisco; D. L. Huntington, president Washington Water Power Company, Spokane; Guy W. Talbot, Pacific Power & Light Company, Astoria, and W. R. Alberger, United Properties Company, Oakland.

The constitution, as adopted, provides for two classes of membership according to the following plan: First, member companies, consisting of urban and interurban railway companies or steam railways having electrified sections, lessees or individual owners of such railways or railroads located in the Pacific Coast States of Washington, Oregon or California; in case this association becomes a section of the American Electric Railway Association, eligibility for membership shall be conditional upon the company members becoming also company members of the American Electric Railway Association; each company member shall be entitled to one vote, which shall be cast by a properly accredited delegate. Second, members, consisting of individuals, copartnerships and corporations that are actively identified with urban and interurban railway interests located in the Pacific Coast States, and any other persons similarly located who, in the opinion of the executive committee, have had experience of such a nature as to render desirable their connection with the association; the privileges of the members shall be similar to those of the company members except that they shall not be entitled to vote or hold office.

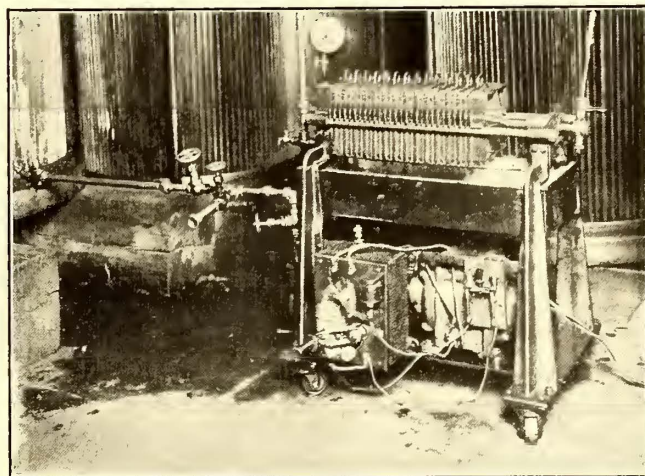
Application will be made to the American Electric Railway Association that its by-laws be so changed as to admit the Pacific Coast Electric Railway Association as a sectional branch, in which case a company to be eligible for membership in the Pacific Coast Electric Railway Association must be first a member of the American Electric Railway Association. Dues for full membership have been

placed at \$50 a year, and an initiation fee of \$25 will be charged. The rest of the money required will be raised on a percentage basis of gross earnings.

Much credit for the organization is due to F. W. Hild, of Portland, who perhaps more than any other was the originator of the idea which has made the association an accomplished fact. A secretary, to devote all of his time to the association, will be employed, and special attention will be given to public relations. Besides the Pacific Coast representatives there were present Secretary H. C. Doncker of the American Electric Railway Association, E. H. Baker, James H. McGraw, Samuel M. Curwen and Secretary H. G. McConaughy of the Manufacturers' Association; also Albion E. Lang, past-president American Electric Railway Association, and Safford K. Colby, vice-president Allen & Peck, Inc.

PURIFIER AND DRIER FOR TRANSFORMER OIL

An electrically operated press and filter for cleansing and restoring the dielectric strength of transformer oil is made by E. J. Hunt, Newark, N. J., who now has several of these machines in service. As shown in the accompanying illustration, the device embodies a series of filters through which the oil is forced at the rate of 6 gal. per minute (in the standard size). One passage of the reclaimed oil through these filters is sufficient to raise its dielectric strength from an initial value of 15,000 volts to



Transformer Oil Drier and Purifier

40,000 volts and even to 50,000 volts. In one instance, a very large public service company was about to use about 100 barrels of old transformer oil for road sprinkling when it was persuaded to try reclamation with one of these presses. Before filtration this oil showed a dielectric strength of only 11,200 volts on an oil gap of 0.2 in., which made it practically worthless for transformer purposes. After one passage through the filter press, the dielectric strength for the same gap was raised to 25,600 volts and after thirty minutes' continuous circulation without changing the filter papers the dielectric strength for the same gap was brought up to 55,700 volts. In about two weeks the hundred odd barrels of oil were reclaimed at a total saving more than double the cost of the press.

Another public service company reports that the oil so treated is not only cleansed thoroughly but is also freed from every particle of water. The fact that one of the transformers held some water in suspension revealed one very good feature of the press, namely, that when water is contained in the oil it will be stopped by the filter paper. This filter paper becomes thoroughly saturated and so will not pass any more oil, thus raising the pressure to such an extent that it becomes necessary to shut down the machine to substitute new paper.

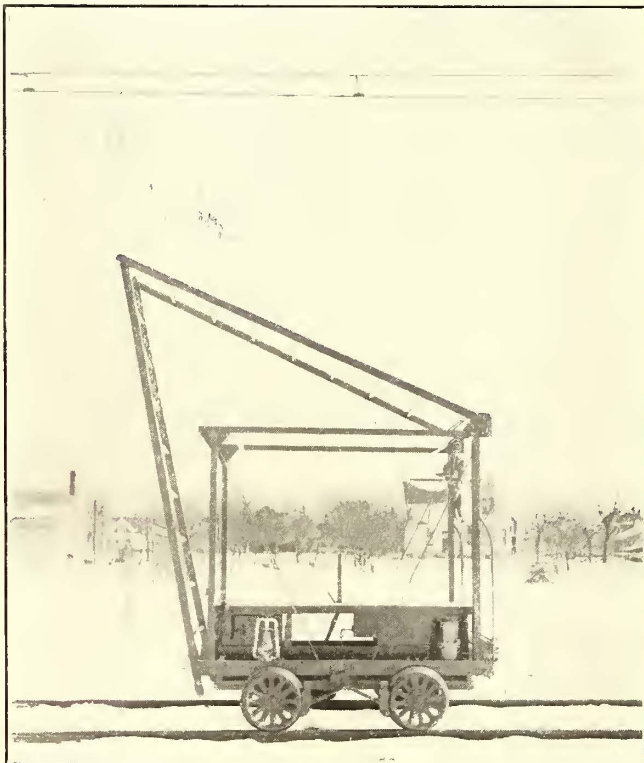
PENNSYLVANIA ELECTRIFICATION PLANS

Although no official information has been forthcoming regarding the details of the plans of the Pennsylvania Railroad Company to electrify its main line from Philadelphia to Paoli, this paper is unofficially informed that alternating current will be used and that the company will buy power locally, at least for the next few years. The announcement of March 15 regarding the Philadelphia-Paoli electrification stated that the improvement would involve the expenditure of \$4,000,000 and would be completed in 1914. It was assumed that the company's plans included the erection of its own power house, but this is an ultimate rather than an immediate probability.

The next steps in Pennsylvania electrification cannot be stated with official exactness, but it may be said that logically electrification of the Baltimore terminal and tunnel would be the step to follow the completion of the Philadelphia work, and that with the electrification of the Washington (D. C.) terminal next in order, the linking up of Washington, Baltimore and Philadelphia by electrified lines will not be long delayed.

EMERGENCY LINE CARS FOR MILWAUKEE

The Milwaukee Electric Railway & Light Company has recently placed in service six gasoline motor cars for making overhead repairs on its interurban lines. These cars are designed for emergency work only, repairs of a heavier nature, such as stringing in several spans of catenary construction, and the maintenance of the transmission line being handled by one of the heavy line tower cars specially equipped for such work. The cars were arranged by the company as shown in the accompanying illustrations, the



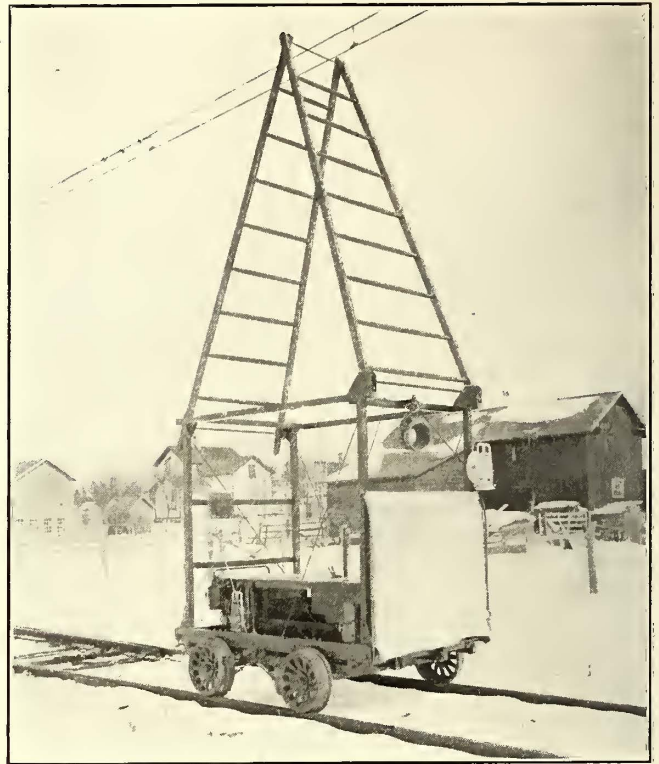
Milwaukee Emergency Line Car—Frame Lowered for Running

superstructures being built upon the bodies of standard Fairbanks-Morse section motor cars.

Each car is equipped with an 8-hp air-cooled two-cylinder, two-cycle horizontal gasoline engine, the crank shaft of which forms the rear axle of the car. The body is arranged with a seat 6 ft. 6 in. long and 23 in. wide, which comfortably accommodates four men. The direct drive

from engine to axle, thus eliminating gears, makes the operation very simple, speed regulation being effected through a spark control and the throttle. A battery ignition system is used.

Each car has been equipped with an A-frame ladder mounted on a rectangular tower, the corner posts of which are supported at the four corners of the car body. The



Milwaukee Emergency Line Car—Frame in Working Position

ladders are arranged on the tower so that they may be dropped to meet average roadway clearance requirements. The base of one of the ladders is pivoted to the tower and the base of the other is provided with two strap-iron hooks which may be dropped over the tie rod at the top tower posts when in the working position or may be lowered to the tie rod between the side sills of the supporting tower when moving over the road.

Other facilities added to the emergency cars in order to make them serviceable for either day or night work include an automobile headlight mounted on the cross brace at the front end of the tower, arranged so that it can be turned in any direction for night inspection work. Lanterns are placed at the side and rear of the car for flagging or emergency use. Wind shields have recently been added to the front end of the car, but some difficulty has been experienced in operating against a head wind when the shield is in position.

Equipped complete, a maximum speed of 30 m.p.h. has been obtained on level track and 23 m.p.h. on a 2 per cent grade. A test of the braking shows that even at the high speeds attained when going down grade the car is readily brought to a stop. This is accomplished by a hand lever which operates brakes on all four wheels at one time. The lever is located within convenient reach of the seat and applies the brakes if moved in either direction.

The overhead line department at Milwaukee considers these gasoline cars as equipped to be valuable assets for emergency use. They are especially applicable to interurban lines of considerable length, and it is expected that they will minimize interruptions of service and enable the company to win the approval of the public through its ability to cope with any situation which may arise.

FARE COLLECTION AT PROVIDENCE

The use of the Rooke system of automatic fare collection on the lines of the Rhode Island Company has increased from the initial trial installation of six years ago to the point where every car operated in the passenger service of the road is using this method of registration, and about 900 registers are in use.

The register is carried by the conductor, as it weighs but 21 oz. In brief, it is a small nickel-plated box having a coin slot on one side, through which the passenger inserts the nickel, the coin being drawn into the device by the mechanism of the register as soon as its edge touches certain levers within the slot, whereupon the fare is registered automatically. The coin passes entirely through the register immediately after it enters the receiving slot, ringing a bell in the register as it is recorded, and is delivered into an open receiving compartment at the bottom of the device, thus becoming available for making change. When



Providence Fare Collection—Receiving Fare in Portable Register

the coin has once entered the slot it cannot be withdrawn but must pass through the register into the conductor's hand. The entrance to the coin passage is automatically closed by the passage of the coin, and no additional coin can be inserted until the re-setting of the opening by the conductor.

The Providence equipments carry two totalizing registration trains, one for nickels and one for dimes, and in the latest type of register made by the Rooke Automatic Register Company at its factory, in Providence, R. I., an additional counter is provided for metal tickets. It is not intended, however, that the public should pay fares in dimes, and while the dime registration feature is built to withstand the same hard service imposed upon the nickel-recording mechanism, the rules of the company require nickel payments alone. Signs carrying instructions for passengers as well as a request for them to have nickels ready for payments are posted in all of the Providence cars. It is, however, possible for the conductor to make change and to use both hands in so doing, since the register is provided with a ring through which the conductor passes his middle finger, and when both hands are required the register is allowed to turn upon the finger and drop after the manner of the ordinary transfer punch.

With this system the conductor has nothing to do with the registration and does not handle the money until after it is registered. While the passenger and the conductor appear to be alone in this exchange of money for service, the company is actually present interposing the register between them. The registration mechanism is sealed at the factory and traffic records are obtained by subtracting successive readings. On the lines of the Rhode Island Company and elsewhere experience with this system shows that at least 90 per cent of fares formerly lost to the company are collected by its use.

The register is in no sense a money container. It operates in full view of the conductor and the passenger, can be held in any position or at any angle best suited to the passenger's convenience or to the conditions prevailing in the car, and accommodates in its lower receptacle eight or ten fares, or at least as many as a conductor would ever accumulate with his outstretched hand before examining and pocketing them. The registration has a total capacity of 99,999 nickel readings. It is the usual practice with the Rooke system not to register transfers.

The accompanying photograph shows the application of the Rooke system to the platform collection type of car used in Providence. The conductor stands behind the railing in the vestibule, and the portable character and small size of the register are important points in the facility with which traffic can be handled. The space taken up is negligible, and in case the conductor is obliged to make change for one or more passengers in an entering line he can save time by presenting the register to others in the line without waiting for all to pass a predetermined point. Actual counts show that eighty passengers have been loaded and their fares all taken in two minutes on a single car making a stop in front of a large factory at closing time. In some cases individual registers handle as many as 3000 fares per day.

Apart from the accuracy of the system and its removal of temptation from the conductor, the makers emphasize the point that it saves the conductor time otherwise consumed in manipulating the register cord or bar, and also obviates the registration of false fares by passengers who mistake the register cord for the bell cord. On the older cars of the Rhode Island Company the conductor makes the usual personal collection from passengers on the inside, and the use of the portable register has been found a convenience to the public through its avoidance of jerky attempts to reach the ordinary register cord on the part of short conductors. The collection of fares by this method on crowded open cars during the open season has been very successful. No new printed reports of any kind were required in Providence on account of the adoption of this system. Conductors use the same trip sheets as before.

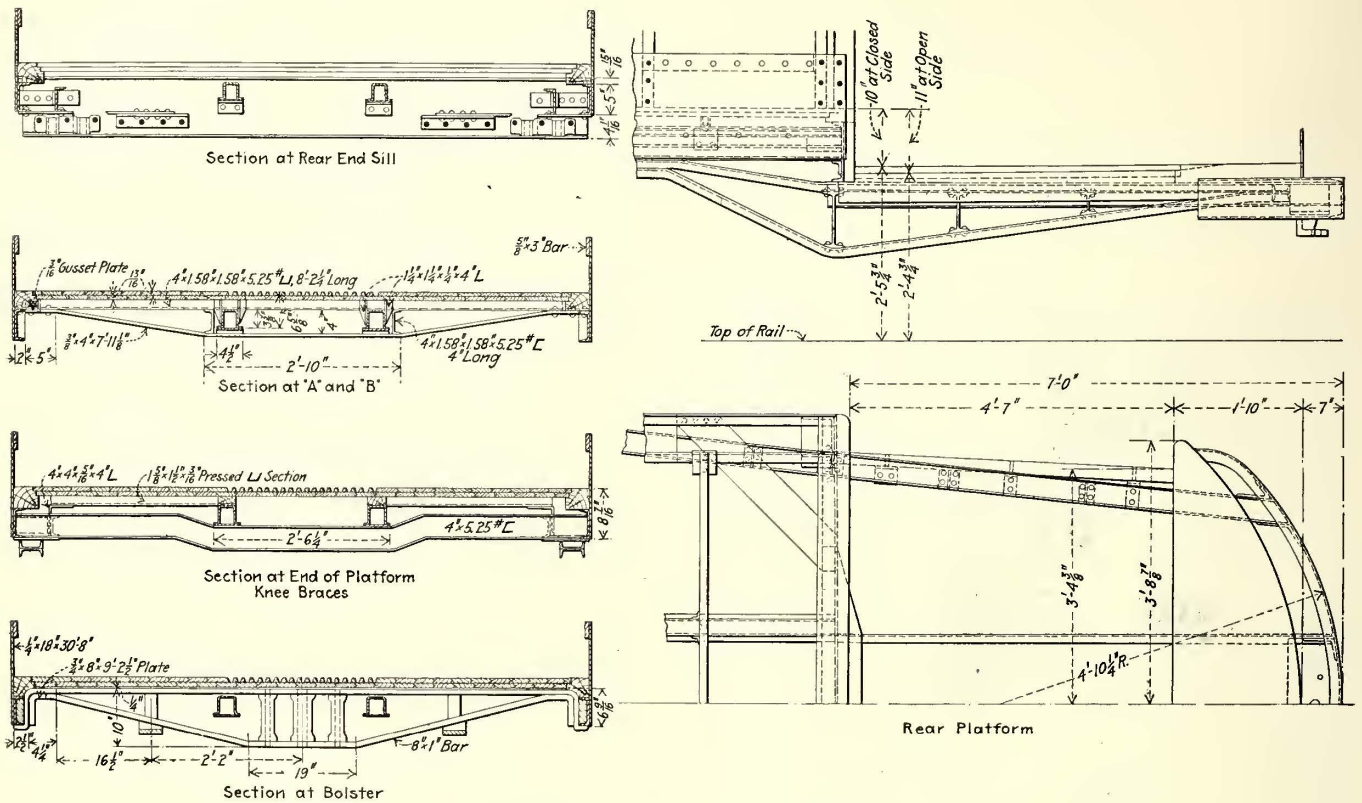
Registers are leased by the maker on terms which cover inspection and repairs. It has been found that in the extremely few cases where a register has been stolen the conductor has found the theft so great a burden that the registers have been anonymously returned. A brief account of the operating rules for the Rooke system was given in the *ELECTRIC RAILWAY JOURNAL* for Nov. 30, 1911, page 1321, together with an outline of the legal decisions upholding them.

An American consul reports that several municipalities in a Latin-American country, with the approval of the national government, are offering very favorable terms and concessions to persons to build an electric railway to connect certain points. The line will be about 36 miles long, over a generally level and easily graded country, well watered and provided with ample water power for the plants. Contractors and companies interested in electric railway construction and materials can obtain further particulars by addressing No. 10494, Bureau of Foreign and Domestic Commerce, Washington, D. C.

NEW CARS FOR ROCHESTER

Twenty cars which were recently put into service on the Rochester lines of the New York State Railways show the effect of careful design with a controlling purpose of reducing weight without sacrificing necessary strength. The new car weighs 35,900 lb. and the seating capacity is forty-six, giving a unit weight of 780 lb. per seat. As

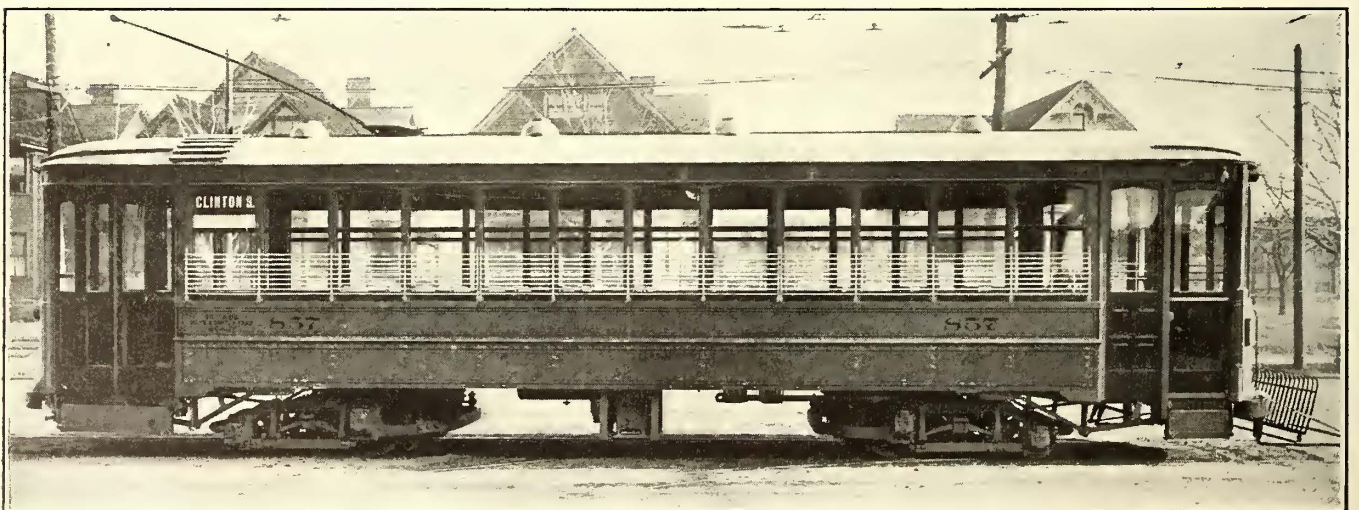
sill consists of a steel plate $\frac{1}{4}$ in. x 18 in. At the bottom on the inside is riveted a 5-in. steel channel weighing $6\frac{1}{2}$ lb. per foot. This serves to stiffen the sill and also to support 4-in. channel's, weighing $5\frac{1}{4}$ lb. per foot, which connect the side sills and in turn support the floor. At the top of the sill, on the inside, is riveted a steel stiffening bar, $\frac{5}{8}$ in. x 3 in. The bolsters are built up of 1-in. x 8-in. steel with the ends bent so as to hook under the



Rochester Cars—Details of Framing

shown in the accompanying cross-sections of the underframe, all of the weight is carried by the reinforced side sills. While the design is special the standard parts used by the manufacturers were employed as far as possible and in construction the original designs were slightly mod-

ified to facilitate manufacture. A folding door and step and an original sanding device due to G. M. Cameron, master mechanic, are among the interesting features. The underframe is very light, but the liberal factor of safety of six was allowed in the essential parts. The side



Rochester Cars—General View Showing Folding Doors and Steps

present cars these conduits do not project under the front platform, but in the next cars one will be continued to a point under the controller to give additional protection to the wiring.

The design of the body is not radically different from

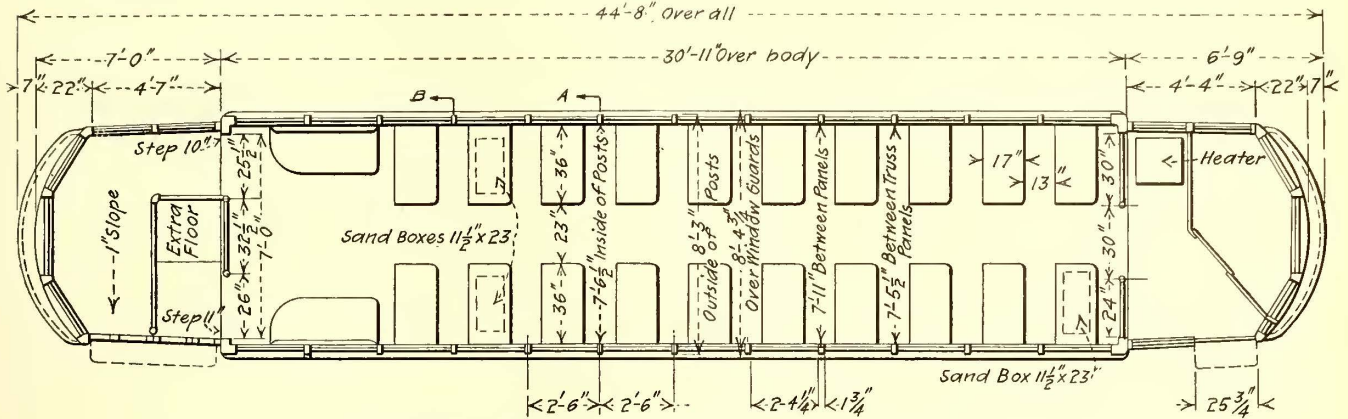
The design of the body is not radically different from

The design of the body is not radically different from

that of other recent prepayment cars with arch roof. There is no bulkhead separating the platform space from the main portion of the car. A light railing takes its place and the cross seats are placed close to the railing. The motorman's compartment is inclosed by a light partition which cuts off a part of the front platform. The hot-air heater is located outside of the compartment, but in later cars the location of the partition will be changed so as to include the heater in it. To facilitate the cleaning of the floor under the seats a type of seat was selected with no obstructions below. These seats are supported upon shelves on the window side and pedestals on the aisle side. When

ning and ending the trip, the number of passengers carried, the number of stops made and the energy consumed. From this information the results were reduced to standard form. The tests were made on the Clinton Street line, which is about 4 miles long and extends in both directions from the business district. The gear ratio used was 16:82.

The tests show that, with approximately 100 passengers carried per hour, seven and one-half stops per mile were made with a schedule speed of 8.3 m.p.h. The energy consumption was 2.4 kw-hr. per car mile, or 119 watt-hr. per ton mile, the values for different days being quite uniform



Rochester Cars—Plan Showing Seating Arrangement

the cushions are lifted off for sweeping there is no obstruction to interfere with the motion of the broom.

A new form of folding door and step is used. The door is folded away from the center by means of cranks and rods operated from an overhead shaft, the two sections of the door being hinged on vertical shafts. The rear-door shaft is connected with a crank and lever below the floor to raise and lower the step. The doors are guided by means of rollers mounted on bearings near the tops of the doors and working in a guide groove. The form of this groove was worked out experimentally to give a straight-line motion to the inner door edge and also to lock the door in the closed position. The position of the operating strap from the overhead shaft is such that the conductor is obliged to look toward the door in closing or opening it, so that he gets a good view of boarding or alighting passengers.

In the motor and control equipment the important fact to be noted is that field control is used in connection with a manual controller. The motors are Westinghouse No. 307-A-3 and are the first of this type to be made with split frames. They are mounted on maximum traction trucks. The controller is type K-51-A, which, through the use of field control, provides four running points.

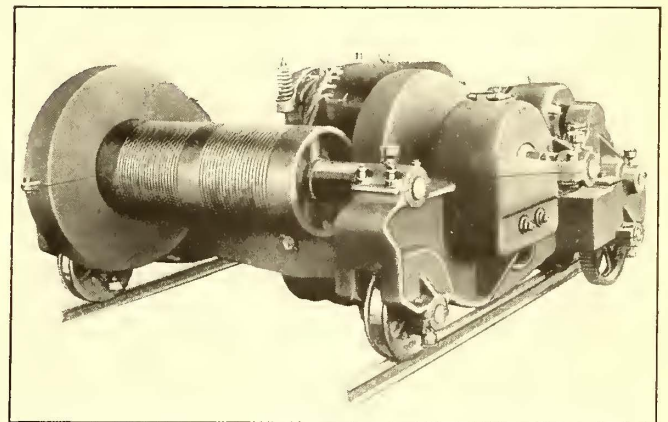
The bell cord is carried under the center of the arch roof in a small conduit and is thus out of the way of passengers' hats. It is used only in emergencies as the signaling to the motorman is done automatically by the opening and closing of the rear door. Signaling is accomplished by a contactor mounted at the rear end of the overhead shaft which operates the door, and signal lamps in the front of the motorman's compartment are illuminated when the door is closed. The contact cannot be made until the door is tightly closed because the shaft has to move through a considerable angle after closing the door in order to lock it. It is during this locking period that the signal lamps are lighted.

A series of tests has been conducted during the past three months to determine the operating efficiency of the new cars. A sample car was equipped with a Sangamo watt-hour meter and observations were made for many days. These comprised, for each trip, the time of begin-

ning and ending the trip, the number of passengers carried, the number of stops made and the energy consumed.

A NEW CRANE TROLLEY WITH INCLOSED GEARING

A new design of trolley for electric traveling cranes has been brought out by the Whiting Foundry Equipment Company, Harvey, Ill. All gears are inside the main bearings and this absolutely prevents gears from working off their shafts and falling below. The trolley trucks are steel castings of I-beam section, and the bearing caps are held in place by bolts which extend through the flanges, making them very accessible. The mechanical brake of the hoisting mechanism is contained in a pocket in the truck. Necessary adjustments can be made without removing cover.



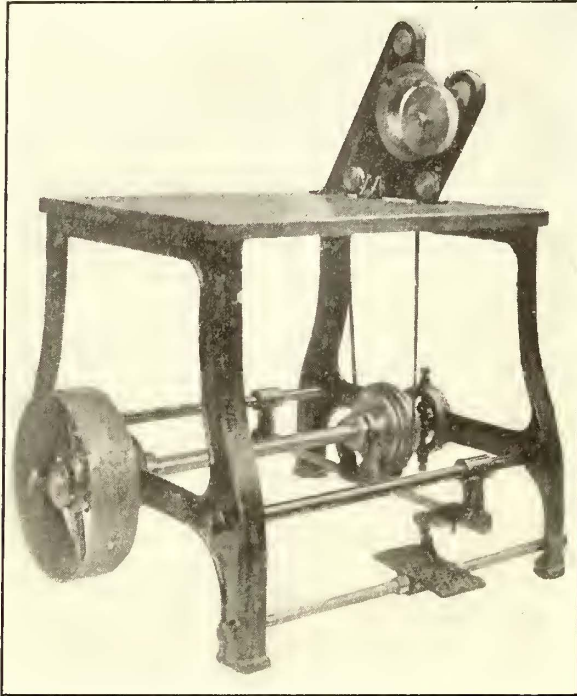
Electric Traveling Crane Trolley of the Completely Inclosed Type

Both the hoist gearing and the trolley travel gearing have only two reductions from the motor. All gear cases are cast iron with horizontal machined joints, and liberal opening is provided in each case for inspection and lubrication of gearing. The shaft boxes are all integral with truck castings. All bearings are cast iron with babbitted shells except the axle bearings, which are bronze, and all bearings are machined to gages, turned on the outside and

fitted into bored boxes. It is claimed by the manufacturers that this trolley, which is made in an unusually wide range of capacities, is the most accessible of the trolleys with gearing completely inclosed that are on the market. Modifications in construction are, however, made to meet special conditions of customers when necessary.

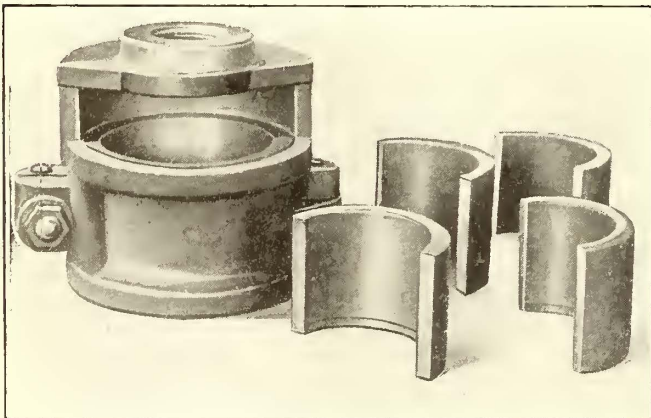
TWO NEW AIDS FOR THE ELECTRICAL SHOPS

The Columbia Machine Works & Malleable Iron Company, New York, has lately enlarged its line of electrical specialties by the addition of the armature-coil taping



Armature Coil-Taping Machine

machine and lathe chuck for boring bearings shown in the accompanying illustrations. The new taper is an improved machine which has already shown its worth in the shops of the Interborough Rapid Transit Company, New York, and of other railways. This machine, of course, permits the coils to be taped much faster than could be done by hand,



Lathe Chuck for Armature and Axle Bearings

and it also permits better work because it pulls the tape tighter and more uniformly. The operating speed can be increased from 100 r.p.m. to 225 r.p.m. in accordance with the growing skill of the operator. The entire mechanism, including the drive, is carried on a metal framing, which has a hard-wood top 24 in. x 36 in., to give a handy work

table. The driving pulley is located near the floor line in a position which makes it equally accessible for drive from above or below. A friction clutch and automatic brake serve to stop the machine instantly at any point of revolution when the operator removes his foot from the treadle.

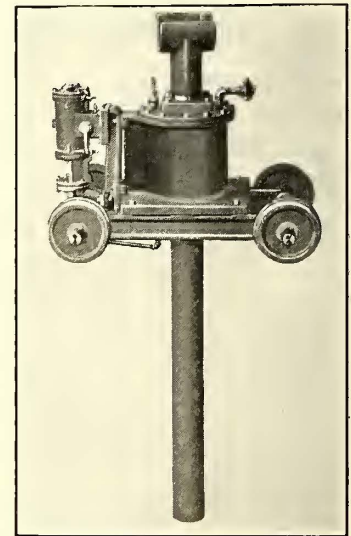
The lathe chuck for boring axle and armature bearings is threaded to fit any lathe spindle, and with it bushings are furnished to accommodate all sizes of bearings which the customer uses. An allowance of 1/32-in. to finish the bore is left by the manufacturer so that the chuck will be absolutely true on the user's lathe.

As an example of the high-grade miscellaneous work done by the Columbia company, mention may be made of the fact that it now has in hand 250 lighting generators of axle-driven type for steam railroad service.

AN IMPROVED PIT JACK

The Watson-Stillman Company, New York City, has recently made an important change in the construction of its hydraulic pit jacks by replacing the old fashioned hand-operated pumps by pumps which are driven by air engines. These are attachable to any style or size of jack manufactured by the company. The use of compressed air at about 90 lb. per sq. in. pressure has become so universal in repair shops that the air-driven engine adapts itself admirably to modern shop equipment, and to make the air connection for one of the new pumps it is merely necessary to run a rubber hose or other flexible tube from the nearest air main to the pump engine just as is done in the case of pneumatic riveters. The operating valves can be placed in any convenient position which will invariably permit the foreman or man in charge to operate the lift in addition to directing the work of his men. The use of this air engine therefore eliminates one man—the pump operator—from the crew.

By the use of air power the speed of operation is very greatly increased. When it is desired to raise the saddle up to the work air is admitted directly to the top of the reservoir, thus forcing the water into the cylinder and lifting the ram at almost any desired speed. As soon as the load becomes too great for this pressure the air is by-passed into the air engine, which in turn lifts the ram. In the jack shown in the accompanying illustration the ram is raised at the rate of 7½ in. per minute, whereas



Pit Jack with Air Pump

only 2 in. per minute is attainable with a hand power pump. The jack illustrated has a lifting capacity of 10 tons and a total raise of 103 in. The ram is telescopic in two lengths of 4-in. and 5-in. diameter respectively, and since it is equipped with an air power pump it embodies the latest feature in these tools.

Five per cent of the gross receipts from the sale of tickets on New York's subway and elevated lines on Monday, March 31, was contributed toward the relief of the flood sufferers. Monday is normally the day of heaviest traffic. The total contribution amounted to \$6,073. This indicates that about 125,000 more tickets were bought than during any previous twenty-four-hour period in the whole history of the company.

LONDON LETTER

(From Our Regular Correspondent)

The Tramways & Light Railways Association held its annual meeting in February followed by a successful dinner at the Trocadero Restaurant. The Hon. Arthur Stanley presided at the meeting. He referred to the principal feature of the year, the passing of the government's light railways act. The association did not get all it desired as it was still necessary for trackless trolley schemes to proceed by bill as before, instead of being promoted as light railways. Many matters connected with the national insurance act had received attention, and the association had also negotiated with the General Post Office in regard to guard wires, and a special committee was actively engaged in the preparation of a set of standard rules for motormen and conductors. Mr. Stanley also presided at the annual dinner. Mr. Stephen Sellon proposed the toast of "Our Guests" and referred to the excellent work which the association had been able to do in the modification of the light railways act. He also congratulated the Municipal Tramways Association upon the work it had accomplished and upon the way in which that association worked in conjunction with the Tramways & Light Railways Association. Lieut.-Colonel Sir Arthur Yorke, responding for the guests, stated that it was a pleasure for him as a Board of Trade official to do all that he could to assist tramway enterprise. A. R. Fearnley, president of the Municipal Tramways Association, proposed the toast "The Tramways and Light Railways Association." During the past year the two associations had the satisfaction of co-operating in a number of matters referred to. He trusted that the result of the visit of the deputation to the Postmaster-General on the matter of control of all telegraph and telephone wires would be to introduce restrictions on guard wires. He hoped that the deputation might help to secure the decision of the Postmaster-General, so that telegraph and telephone wires might be placed underground in city areas at least. He also suggested broadening the scope of the association so that it might look after the interests of trackless trolleys and motor buses, as the present year promised to be a busy one in Parliament in respect to applications for that class of work. The work of the traffic board and the committee inquiring into fatal accidents in streets due to power-propelled vehicles also deserved the attention of the association. Mr. Stanley replied to the toast.

General satisfaction is expressed at the decision of the London County Council not to proceed at present with the construction of tramways over St. Paul's Bridge. The great objection was that the scheme provided for a subway terminus under St. Paul's churchyard in the immediate vicinity of the cathedral. Much expert testimony was brought to bear upon the fact that the construction of such a subway created a real danger to the cathedral, the foundations of which at the present moment are evidently none too secure. Sir John Benn endeavored to get the Council's assent to the proposal to bring the tramways over the new bridge without construction of this terminus, but as the construction of the bridge is not likely to be begun for some time the Council can consult with the City Corporation regarding this later.

Stockport has completed a system of new trackless trams between Stockport and Offerton, a distance of $1\frac{1}{4}$ miles, and a quarter-hour service of cars will be maintained. Should the cars prove a success the Stockport Corporation will extend the system, probably in the direction of Marple. The overhead equipment of this system cost about £800 a mile and the cars about £700 each. The type of trackless system adopted is known as the Bremen system. In the system which has been described several times in these columns, namely, the R. E. T. system, in use in Leeds, Bradford, Dundee and Rotherham, the current is derived from and returned to the overhead wires by means of twin rigid trolley poles. In the Bremen system a flexible rope trolley is used, which is paid off from and rewound onto a spring drum as the car deviates from its path. The weight of the trolley is suspended from the upper (negative) wire. The Stockport installation is the first of its kind in England.

A new 5000-kw turbine for the Pinkston power station of the Glasgow Corporation Tramways has been formally taken

over from the makers. About three years ago the corporation installed a turbine of 3000-kw capacity, and this, with the original reciprocating engines, carried the whole load. Now the entire electricity supply will be provided by the two turbines. The original engines will be reserved for emergency use. The new turbine and generator cost about £10,200, making in all £20,400 for both turbines, as compared with £102,000, the cost of the original plant.

The Glasgow tramways committee has decided to allow policemen in uniform and while on duty to travel free on the cars.

The Manchester tramways committee has decided to contribute £100,000 in relief of the rates, after allowing for depreciation and other incidentals. It is pointed out that improvements have been made during the year in the conditions of service for tramway workers, the penny stages lengthened and the age raised for the payment of half fare. The sum mentioned is the largest that has been contributed by any municipal undertaking for the same period. The service has been established ten years and the system has contributed altogether £700,000 toward the relief of the city rates.

A new type of petrol-electric motor omnibus is being tried on the Hastings roads with a view to its being approved for use on the Front line. The question of the best system of locomotion for the Front has been raised by the action of the Hastings Tramway in promoting a new bill in Parliament, and this has roused frontagers to opposition, unless some undertaking is forthcoming that shall not provide overhead wires. A conference is to take place between the company and the Corporation on the subject. The Board of Trade has intimated that it intends to condemn the stud system in six months' time, and this fact, together with the trial of the new bus, may have some effect in leading to an amicable solution of the traffic problem at Hastings.

The work of electrifying the East London Railway has been completed. The line is $5\frac{3}{4}$ miles long and the work has been undertaken by the engineering departments of the various railways interested in this line. It runs from Shoreditch to New Cross via Whitechapel and Wapping, and is leased to as many as six companies, the Brighton, Great Eastern, Southeastern, Chatham & Dover, Metropolitan and Metropolitan District Railways. The system is the same as on the Metropolitan and the Metropolitan District Railways, and current will be supplied from the Lots Road power house at Chelsea. The new passenger service will be provided by the Metropolitan Railway. A complete system of automatic signaling has been installed. The cost of conversion, estimated at about £90,000, is being borne by the Great Eastern Railway.

The London City Council, by means of reduced tramway fares, return tickets and other devices, appear now to be able to hold its own against the competition of the motor omnibuses. For the first time in nine months an increase in the traffic receipts is recorded. The Council has recently been experimenting with number plates on the cars to indicate the route, and it has been decided to adopt the scheme for all its lines. It has also decided to proceed to equip a number of trail cars for service in the Woolwich district. Old horse-car bodies will be employed for this purpose. They will be equipped with route indicators and wired for electric lighting, the bodies being mounted upon light strong underframes of standard rolled steel sections. In addition to the drawbar, the trailer is connected to the tractor by a bell cord, a jumper cable for the lighting circuit and a pair of telescopic gates protecting the gap between the two cars.

At a meeting of the Rotherham Council the chairman presented some figures as to the successful working of the R. E. T. trolley omnibuses, which have now been working for about six months. The period under review, however, was for four months, and the average receipts for these four months, at the worst part of the year, were 10.03d. per car mile, and the total expenses, including capital charges, slightly over 7d. The engineer and manager estimate that the average cost throughout the year will be lower than this figure, while the receipts ought to increase. Included in the cost of 7d. is a sum of $\frac{3}{8}$ d. per bus mile for road maintenance and $1\frac{3}{8}$ d. per unit for electrical energy.

A. C. S.

News of Electric Railways

The Kansas City Franchise Negotiations

Senator James A. Reed, who is acting as adviser to the city administration of Kansas City, Mo., in the negotiations which are being conducted between the city and the Metropolitan Street Railway for an extension of the franchise of the company, presented the proposal of the city to the company at a meeting of the representatives of the company and the city on March 19, 1913. The terms as outlined by Mr. Reed follow the conditions which Mayor Jost set forth in the tentative franchise offer of March 6, 1913, which was referred to at length in the *ELECTRIC RAILWAY JOURNAL* of March 22, 1913, page 555. The proposal of March 19, 1913, includes the following provisions: A capitalization equal to the company's \$28,700,000 bonded debt, and a return of 6 per cent on that for thirty years; a sinking fund to be the property of the city and kept up by taking, first, 2 per cent from the gross earnings before paying interest on bonds, upkeep and other operating expenses and then the remainder to go to the sinking fund; 5-cent fare for three years, after which the city is to have the privilege of making the fare six tickets for a quarter, and if the city should exercise its right to purchase the property within ten years, it is to pay the cost of refinancing not to exceed \$1,000,000.

Ford F. Harvey, one of the receivers of the company, conferred on March 20 with Mayor Jost in regard to the proposal. The other receiver, R. J. Dunham, was in Chicago and could not be present at the conference. Mr. Harvey and the Mayor are said to have discussed the franchise situation for more than two hours. At the conclusion of this conference Mr. Harvey is reported to have said:

"There should be some reward for merit and a penalty for demerit. I am not particularly concerned about the matter of valuation, as that ought to be worked out from the reports of the experts, even if it be necessary to call in a third party. The real principle involved is, it seems to me, and I say it impersonally and not in any way binding on Mr. Dunham or the owners of the property, that no matter what is the fixed return on the investment, the investor should have participation in the surplus, but to what extent I am not now ready to say. That ought to be worked out. The Mayor listened attentively to my views, and I believe I made some impression upon him."

The Mayor said that Mr. Harvey had stated correctly the purport of the conference between them. He added:

"I have great respect for and confidence in Mr. Harvey, and as I understand it he did not call upon me in the capacity of a receiver, but as a friend, that we might exchange our views in the pending matter. As is well understood, I have some fixed ideas on this matter of participation, but my mind is receptive to ideas by anyone who wants to talk about participation and can show me that my attitude should be changed. I was impressed with Mr. Harvey's line of reasoning."

Terms of Proposed Agreement Between Cincinnati Traction Company and the City

The terms of an agreement to be entered into between the city of Cincinnati and the Cincinnati Traction Company have been arranged by the officers of the company in conference with Mayor Hunt of the city, and the agreement, if approved by the Council, the Mayor and the stockholders of the companies which are involved, will be submitted to the voters at a special election and if approved by them will become effective on the first day of the succeeding month.

The articles of agreement include a provision for the surrender of the fifty-year franchise by the company for an indeterminate permit, which practically makes the city a copartner with the company. At the expiration of five years, and upon two years' previous notice, the city may exercise its option to purchase the property of the company upon the valuation submitted. If the city after taking over the property releases it or sells it to some other company within five years after its purchase an additional

15 per cent is to be included in the price which the city is to pay.

The city is to build the rapid transit railway, commonly known as the loop, while the company will furnish the rolling stock and operate it as soon as completed. Officials of the company at first insisted that 2 per cent of the company's capitalization invested in the loop should be allowed it for operating the same, but this was finally waived by the company, when the city agreed to allow it an extra 1 per cent, before the final division of the net profits, amounting to 55 per cent for the city and 45 to the company, shall be allowed. The company agrees to pay as rental 5 per cent of the cost of construction of the loop on not to exceed \$7,000,000, less the amount to be expended by the company for rolling stock and station equipment, and to reimburse the city for interest and sinking fund not to exceed three years during construction. This rental is to care for interest and sinking fund, so as to retire the bonds at maturity.

The company is to be permitted to earn 6 per cent a year on the betterment valuation, which is fixed as follows: "This value shall not exceed the sum of \$7,216,283 plus the outstanding bonds of the Ohio Traction Company, \$2,500,000. The said value shall be determined by said board by allowing the moneys actually expended for and on said properties for betterments; betterments being defined as extensions, additions, replacements and renewals, as distinguished from repairs and maintenance, and adding thereto the reasonable and necessary cost of securing such moneys for the purpose for which they were used and at the time secured, and such sum or percentage as may be deemed by said board equitably to be allowable to the Cincinnati Traction Company and Ohio Traction Company for contractors' profits and other proper expenses; provided that if the said board shall find that the said companies have not expended on said properties for maintenance during their occupancy, in addition to said expenditures for betterments, a sum equal to 14 per cent of the aggregate gross earnings thereof, including the 6 per cent on gross earnings paid to the city of Cincinnati, then and in such case the net value shall be reduced by the difference between said 14 per cent as aforesaid and the sums actually thus spent for maintenance, including such 6 per cent paid to the city of Cincinnati, and if the said board shall find that the said companies have in addition to said expenditures for betterments expended in excess of such 14 per cent for maintenance, this said value shall be increased by such excess. All not to exceed \$7,216,283."

The proposals pertaining to the reduction in fares follow: Six tickets for a quarter or 5-cent cash fare on Cincinnati Street Railway system, with universal transfers on that system, or 5-cent cash fare with transfers throughout the street railway system to and from rapid transit system and Millcreek Valley system; 5-cent fare on Millcreek Valley system within city limits, with transfers to and from the street railway system and rapid transit lines; 5-cent fare on rapid transit line with transfers to and from Cincinnati street and Millcreek Valley systems. Universal transfers from any point to destination, but no round trip; 25 cents per car mile to be charged for interurbans on city lines. Provision is made for a readjustment of fares every five years, while the city, through its supervisors, may require adequate service and proper maintenance, extensions and betterments.

To safeguard low fares and provide against any possible excuse at any time on the part of the company to permit inefficient service because of its inadequate earning power a reserve fund of \$750,000 will be created immediately by the sale of securities, the proceeds of which are to be invested in city bonds. This reserve fund must first be exhausted to meet any deficiency in its earnings before any attempt is made to revise the fares upward. The gross receipts are to be applied as follows:

1. Operating expenses, including 6 per cent street maintenance fund to the city and taxes.

2. Rents to Cincinnati Street Railway, the city for rapid transit line and other rents, interest and sinking fund on \$2,500,000 bonds of Ohio Traction Company.

3. Six per cent on betterment valuation.
4. Any deficit due the city.
5. Amount necessary to reimburse the assurance reserve fund.
6. Amount necessary for renewal and depreciation reserve fund.
7. One per cent on betterment valuation.
8. Ten per cent employeecs' pension fund and subject thereto 55 per cent to the city and 45 per cent to the company.

The board of supervisors which will manage the affairs of the company for the city will consist of three members, one to be appointed by the Mayor, one by the board of sinking fund trustees and one by the company. This commission will have absolute power to supervise operation, service, accounting, rates of fares, transfers, extensions, betterments, maintenance and rates charged interurbans. The decisions of this board, however, are subject to revision by the Public Service Commission or a court of competent jurisdiction. All books and records of the company are to be open for the preparation of cases for arbitration from the date of the approval of the agreement by the people until arbitration is closed and thereafter to the Public Service Commission.

W. Kesley Schoepf, president of the company, in a statement which he made after the tentative agreement had been reached, said in part: "While it was necessary for the company to make a great many concessions which will result in rigid economy and close attention to operation to enable us to live under the new conditions, I realize that the construction of the rapid transit line will mean so much to the city that its growth and prosperity in the future will operate to the company's advantage as well as to every other interest in the city. It remains for me to convince the Cincinnati Street Railway and the Ohio Traction Company stockholders that the settlement is one that they should ratify. If they inform themselves thoroughly of the exact situation I believe they will approve the action which has been taken."

Award of Arbitrators in Chicago Wage Controversy

The board of arbitration which for more than five months has been taking testimony and considering the demands of the employees of the railways in Chicago for an increase in wages has presented its findings. In general 2 cents an hour increase was awarded to the men. This applies to all men who have been with the companies eighteen months or more. The increase dates back to Aug. 1, 1912. The men asked an increase on the average of 5 cents an hour. The new scale compares as follows with the demands of the men, the present rate and that offered by the companies:

	Award	Offered	Asked	Present scale
First three months	\$.23	\$.23	\$.30	\$.23
Second three months	.25	.25	.30	.23
Second six months	.26	.26	.30	.25
Third six months	.27	.27	.30	.26
Fourth six months	.28	.28	.30	.26
Third year	.29	.29	.35	.27
Fourth year	.30	.30	.35	.28
Fifth year	.31	.31	.35	.29
Sixth year	.32	.31	.35	.30

The arbitrators were Justice Orrin N. Carter of the State Supreme Court, who was chairman of the board; Harvey B. Fleming, representing the companies, and Judge Kickham Scanlan, representing the men. The majority report was signed by Justice Carter and Mr. Fleming. Justice Scanlan dissented. He presented a minority report. Justice Carter said in part:

"No two authorities will agree on the question of a living wage or a fair wage. An income that one family could live on another family of equal size would find inadequate, while still a third could live on that income and save something. Writers on the subject usually place a fair living wage for an average family at from \$800 to \$1,000, though there are some who put the figure above or below these amounts. The statistics introduced in the record shows that the yearly income of the ordinary laboring man is less than \$800 a year. As a matter of fact, every one knows that many families in this city are living on less than \$800.

"The phrase 'living wage' is often used by different peo-

ple with a different meaning. Some use it as meaning the actual cost of living, others as having the same meaning as a 'fair wage.' If the actual cost of living were the only standard by which to fix wages, then all wage earners should receive the same income, for then it might well be argued that all families of the same size should live on the same income.

"With that definition responsibility, skill and experience would count for nothing in fixing the wage scale; then the janitors and car cleaners employed by these companies whose wages we have been here called upon to fix should receive pay equal to that of motormen and conductors. No one connected with this hearing expects or desires this.

"The men requested this board to allow \$2.25 per day for the first year's work for car cleaners, janitors and terminal men. This, as I figure it, would give the men an income of less than \$800 a year. The finding which Judge Scanlan and I signed as to the pay of car repairers, motor repairers, inspectors and dopers allows \$2.20 per day for the first year's service. This was Judge Scanlan's proposition, which I accepted and voted for. This finding for these men will give them less than \$800 a year income.

"Representatives of the men have argued that the increase of wages of the street car men in Chicago has not kept pace with the increased cost of living, while it has been contended by the representatives of the railway companies that the cost of living has increased less rapidly than the increase in wages. Here the evidence is not conclusive. The data as to the increase of wages and the cost of living are not such, in my judgment, as to justify any positive finding on this point. Every one recognizes that responsibility, skill and experience should count for something in fixing the rate of pay. For this reason I have felt that the discussion should not be as to a living wage, but as to a fair wage.

"The findings made by a majority of the board increase the pay of all trainmen on the South Side lines; for the majority of them the increase is 2 cents an hour. To the men on the 'swing runs' ten minutes' additional time is allowed for the second 'pull out,' for which they are paid. It was stated during the hearing that the North and West Side lines were to abide by the decision of this board as to the South Side lines. The pay of all motormen and conductors on the North and West Side lines will therefore be substantially increased—for the majority 2 cents an hour. The findings also increase the pay for some of the North and West Side trainmen five minutes for turning-in time each day.

"In addition to that, all of the men on the North and West Side lines will be allowed fall-back time for meals (not allowed them under the old contract) for which the company will pay. The working conditions on 'swing runs' and regular Sunday runs will be appreciably improved by the agreement of the parties and the findings of this board under the contract that will now go into force. These findings will cause the North and West Side lines to cease giving extra pay to the trainmen in the so-called night car service. This will affect less than 150 men (to be exact, the record shows 130) out of more than 10,000.

"No one will deny that all men should have some time for rest and recreation. The long working hours of the men on 'swing runs' are such that it would be out of the question for them to undergo the strain of such work day in and day out—Sundays included—during the entire year without lay-offs. Indeed, the trainmen on the so-called 'straight runs,' with the responsibilities that rest upon them, could not do their work without such lay-offs.

"Every one connected with the street railway business in large cities realizes this. Doubtless for this reason there has grown up in this city on the street railway systems a practice of having an extra list of experienced men who can be called into service to take the place of the regular men at any time desired, so that the latter may be allowed lay-offs. The employees favor this plan. I judge from this record that one-fourth or one-fifth of the trainmen employed on the South Side lines are extras, that is, that the average regular man, either because he finds it necessary for his health or because he wants the time for rest and recreation, lays off from one-fifth to one-fourth of the time—an extra man taking his place.

"If I could have seen any way to figure out a schedule of Sunday runs as requested by the men that would go into force at once, I should have been very glad to have voted for it; but on the record it did not seem to me possible for this board to figure out any practicable scheme that could go into force at once. I therefore agreed to the finding that the requests of the men as to the Sunday runs should be put in force as soon as practicable. The wages of the employees other than the trainmen, in my opinion, are fixed by these findings as high as any workmen employed in like lines of labor in this or other cities. The wages fixed for each class of employees were reached in each instance by a compromise.

"With the views that each arbitrator held on many of the points at issue, an agreement could be reached only by compromise. A disagreement might mean a strike. To avoid the danger of such a situation I accepted the responsibility of this work."

Decision in Des Moines Franchise Case

The Supreme Court of Iowa has reversed the decision of Judge J. H. Applegate of the District Court of Dallas County and holds that the Turner franchise of 1868 is not perpetual and that the franchise of the Des Moines City Railway has expired, or at least has been indeterminate since 1898. The Supreme Court concludes its decision in part as follows:

"Our final conclusion is that the franchise has expired, or at least has been indeterminate since the year 1898, but that it would be wrong and inequitable to grant an immediate ouster. We think the company should have a reasonable time to negotiate an extension or renewal of its franchise, or if this cannot be done that it have the same length of time to dispose of its property to some one who will consent to operate under such reasonable franchise as the voters of the city of Des Moines may see fit to grant or to dispose of its property to the city itself should it elect to purchase, or, failing all this, that it have the right to remove its plant, without let or hindrance, subject to any rights it may have against the city or any of the property owners growing out of its payments for a referendum vote and perhaps two submissions to the people at general or special election and much detail work. We are constrained to grant the company the full period of two years from and after the filing of this opinion with which to make compliance herewith.

"It follows that the trial court was in error in holding that the street railway franchise had not expired, and its judgment must be and it is reversed. It is our duty, as we view it, to enter such judgment as the trial court should have entered; and as each party moved for a directed verdict, we believe we have full power in the premises to direct what the final order should be. The case will therefore be reversed and remanded, and at plaintiff's option, a final judgment will be entered in this court.

"It seems, in view of the past history of this controversy, that it is time for some tolerance on both sides. A street railway is absolutely essential to the future growth and development of a city. On the other hand, a street railway has a social profit which cannot be entirely overlooked. Every increase in population, by reason of birth or removal to a city has added to the valuation of its property. Defendant's franchise, were it existent to-day and in perpetuity, would be worth large sums of money. Doubtless the original promoters conducted the business at a loss for a certain length of time and may never have profited a cent therefrom, and they and their successors are entitled to great consideration. Regard, too, must be had for the fact that with the growth of the city the company must necessarily be put to great expense in the way of making extensions and improvements in its plant and must often go into localities which are not now populated at all, or if at all, very meagerly, and by these extensions it builds up and adds value to the property of every citizen. In the final adjustment of matters, we have no doubt that all of these, as well as many other considerations, will be taken into account and we grant the time indicated in order that there may be a period for sober reflection and in the end sound judgment exercised."

Regulation and Not Administration Should Be Function of Commissions

In connection with the bill before the Legislature of Pennsylvania to create a public service commission Randall Morgan, first vice-president of the United Gas Improvement Company, Philadelphia, Pa., and a director and officer of other public utilities, has expressed himself in regard to the function of public service commissions as he views them. He says that the danger of all such legislation is the tendency to impose on the commissions the duty of administering the affairs of corporations. This duty he regards as the proper function of the board of directors elected by the stockholders. The line of demarcation between regulation and administration is often difficult to establish, but it should be clearly drawn. It would be physically impossible for a commission of seven men such as is proposed in Pennsylvania to administer and regulate all the public utilities of that State. The labors of the members of the commission should be confined to regulation necessary to insure good service at reasonable rates. Pennsylvania should profit by the mistakes of the early commissions in other states. The investor should be made to feel that he will be treated fairly by the Legislature and that the property in which he is interested will be permitted to earn sufficient money to provide a fair margin in excess of that which is necessary to meet the annual charges. The fewer mandatory provisions of a bill such as that before the Pennsylvania Legislature the better will the public be served.

Report and Recommendation on the Railroad Situation in New England

The directors of the Boston Chamber of Commerce have issued their report and recommendations upon the railroad situation in New England. The report is addressed to the members of the chamber and a meeting of the full chamber has been called to discuss and take action upon it. Among other things the directors recommend that the Chamber of Commerce take the position that at the present time there should be no legislation which would terminate the existing relations between the railroads. The directors also recommend that the railroads receive no power to acquire electric railways in Massachusetts. The recommendations of the directors in regard to the electric railways, the proposed tunnel at Boston and terminal electrification follow:

"The majority of your board of directors believes that it is unwise to permit our steam railroads to purchase electric railways in Massachusetts or acquire additional interest in other classes of property not necessary to the operation of railroads. In order to secure the improvements most needed in our railroad service we believe that the attention of the railroad management should be centred directly on the projects and problems we have reviewed, and that there should be no diversion of thought or capital to those which are not so immediately pressing. Moreover, railroad skill should be utilized in the improvement of railroad service and not in further experiment with other classes of transportation.

"The proposed tunnel under the streets of Boston would, if built, be constructed chiefly to furnish added passenger facilities, for freight can now be transferred between the yards on the north and south sides of the city by means of the Union Freight railway, and it would also be comparatively simple to transfer freight cars around the waterfront by means of car floats. The tunnel is not imperatively needed, and, in our opinion, it is better to postpone for the present its construction and to conserve the financial resources of the Boston & Maine Railroad for more urgent needs.

"What we have said in regard to the expediency of postponing the construction of a tunnel between the north and south sides of the city we think applies in general to the electrification of any substantial portion of the Boston & Maine system. We do not mean to intimate that the chamber does not believe in electrification to a reasonable extent and within a reasonable time. We believe, as your committee on transportation has already reported, that this matter should be left in the control of the Railroad Commission

with power to indicate when and where a beginning should be made. Let us first secure freight cars, locomotives, improvements at the present badly congested junction points, and other facilities imperatively required."

Associated Manufacturers of Tramway and Railway Material

J. Sutherland Warner, of the Warner International & Overseas Engineering Company, Ltd., London, Eng., as chairman of the council of the Associated Manufacturers of Tramway & Railway Material, calls attention to the objects and influence of the association with regard to the tramways, railways and allied industries. He refers to the enormous annual purchases made by tramway and railway officials and the difficulties which are experienced in framing specifications and suitable standard clauses governing conditions of tender, acceptance and completion of contracts and says that the association will work for the settlement of acceptable standard clauses and bases of intercourse between the different interests and will refer all differences to a representative council for decision so as to avoid lengthy and unprofitable disputes. The subject of exhibitions, their support and encouragement will receive consideration from time to time. All purchasers, he says, experience difficulty in securing and maintaining touch with manufacturers and their agents and he believes that the occasional attendance of buyers at well-organized exhibitions is essential. The council of the association has considered the question of national and international representation and has decided to admit foreign manufacturers to the association. Mr. Warner says that many influential manufacturers are already members of the association, the subscription of which is £2 2s. annually. Applications for membership should be sent to William Hopkins, secretary of the association of Manufacturers of Tramway and Railway Material, Westminster Palace Hotel, London, Eng.

Temporary Operation of Steinway Tunnel

Within a few months the Steinway tunnel, under the East River, and the Centre Street loop subway in Manhattan will be placed in temporary operation. The Public Service Commission for the First District has authorized the Interborough Rapid Transit Company to arrange to place the Steinway tunnel in operation at the earliest possible date and has directed the New York Municipal Railway Corporation (Brooklyn Rapid Transit Company) to connect its elevated railroad tracks crossing the Williamsburg Bridge with the Centre Street loop subway and to operate the same temporarily from the bridge down to the Chambers Street station underneath the new Municipal Building.

The operation of the Steinway tunnel will prove a great benefit to the people of Queens Borough. The tunnel, which runs under the East River from Forty-second Street, Manhattan, to Long Island City, has been completed for nearly five years, but has never been operated because the company had no valid franchise for its use. Under the dual system contracts the tunnel was sold to the city and became a part of the city's rapid transit system. It will be operated as a part of that system by the Interborough company. Eventually it is to be extended in Manhattan westward to Times Square and in Queens northeasterly to the Queensboro Bridge Plaza. Pending the completion of these extensions the contracts provide for temporary operation, and this will probably be effected by the use of trolley cars with free transfers to and from the existing subway at the Grand Central Station.

A large portion of the travel to and from Brooklyn will be benefited by the temporary operation of the Centre Street loop subway. This subway connects the Williamsburg, Manhattan and Brooklyn Bridges, and as soon as connection can be made with the tracks over the Williamsburg Bridge Brooklyn elevated trains, which now discharge their passengers at the Manhattan end of that bridge, will be brought through the subway down to the City Hall. There are stations at the Bowery, Canal Street and Chambers Street, so that many passengers who now have to pay an additional fare to get downtown from the Williamsburg Bridge will be enabled to travel without change of cars to

their destinations. The greater part of this subway has been completed for some years, but the completion of the southernmost section was delayed by the construction of the Municipal Building, in the basement of which the terminal station is located. Eventually the subway will be extended down Nassau Street to Broad Street and through Broad Street to a connection with the Whitehall-Montague Street tunnel to Brooklyn. It will be operated by the New York Municipal Railway Corporation as a part of the dual system.

The Public Service Commission for the First District has approved the assignment of the dual system contract with the New York Municipal Railway Corporation to the New York Consolidated Railroad. The latter company is the owner and present operator of the Brooklyn elevated railroads, which are to become part of the dual system. The New York Municipal Railway Corporation made the contract with the city and now transfers it to the New York Consolidated Railroad, which will be the operating company. The Municipal Railway Corporation will provide the money to carry out the terms of the contract with the city, and the Consolidated company will pay to it all earnings up to but not exceeding 6 per cent of the par value of the Municipal corporation's stock. The Consolidated company also guarantees the Municipal corporation's bonds as to principal, interest and sinking fund.

The Public Service Commission for the First District of New York has adopted and sent to the Board of Estimate and Apportionment a certificate granting to the Manhattan Railway the right to build and operate certain additional tracks on the Second, Third and Ninth Avenue elevated lines in Manhattan and the Bronx. This is popularly known as the third-tracking certificate and will enable the Interborough Rapid Transit Company, which leases the Manhattan Railway, to complete the third-track on those lines and operate through express service from the southern part of Manhattan to the terminals at the Harlem River and in the Bronx. The grant of the third-track privileges to the Manhattan Company is the last of the contracts necessary for the completion of the dual system of rapid transit to be adopted by the commission. It also ends the dispute over the question whether the certificate should be made out to the Manhattan Railway or to the Interborough Rapid Transit Company. Following the refusal of the former company to accept the grant, negotiations between the two were begun and an understanding was reached by which the Manhattan Railway agreed to accept the certificate and the Interborough company agreed to pay the Manhattan Railway \$25,000 a year for twenty years in addition to the \$10,000 now payable under the lease for expenses of maintenance, etc. This was followed by the formal withdrawal of the Interborough company's application, which left the commission free to issue the certificate to the Manhattan Railway Company.

Detroit United Railway Appeals to United States Supreme Court

The Detroit (Mich.) United Railway has appealed to the Supreme Court of the United States from the decision of the Supreme Court of Michigan empowering the city to eject the company from Fort Street, Detroit. In the writ of error filed in the Supreme Court, which resulted in the granting of a stay of execution to the company, it is set forth that the city has no jurisdiction over the Detroit United Railway using the city's streets, as the street railway lines in Detroit constitute part of a system operating under a State franchise. The company argues further:

"Prior to the decision of the State Supreme Court it was settled law in the State (1) that a State franchise granted to a railroad to construct, maintain and operate a railroad becomes attached to and a part of the physical property and is as permanent and perpetual as that property, and (2) that the terms and conditions of the local contract are not a part of the State franchise and quo warranto will not lie as a violation thereof. As the 'local consent' as distinguished from the terms and conditions of the 'local contract' necessarily adheres to and becomes a part of the State franchise, to maintain and operate, making it complete and effective and an individual State franchise, it follows that this State franchise (including the local consent)

is property within the meaning of the due process of the law clause of the Fourteenth Amendment, and the owners of that property cannot be deprived of it by a decision of a State court any more than by legislative enactment."

The general trend of the company's arguments is to the effect that the decision of the State Supreme Court empowering the city to eject the company from Fort Street is a violation of the Fourteenth Amendment to the Constitution of the United States, which provides that no person or company shall be deprived of property without due process of law. The company also maintains that the act gives the city the right to impair the obligation of a contract, which is also in violation of the Federal Constitution.

Power Improvements of the British Columbia Electric Railway

The British Columbia Electric Railway, Ltd., Vancouver, B. C., is constructing a receiving station which will regulate the distribution of current to the company's territory on the southern mainland of British Columbia. The site for the building is on the boundary line of the city of Vancouver, where the company has a large tract of land. The total expenditure which will be made on the property is estimated at \$250,000. A main receiving station and a small substation, both of steel and reinforced concrete type, are being put up. They will be one story in height, with an additional story for the transformer galleries. Four incoming lines will deliver current to the receiving station at 60,000 volts. The electrical equipment will consist of four banks of three transformers, each with a total capacity of 36,000 kw, by which the current will be stepped down from 60,000 volts to 11,000 volts. The substation which will be erected in connection with the receiving station will be equipped with two motor-generator sets and a bank of 11,000-2200-volt transformers. The supply of current for railway purposes and for public and private lighting in the vicinity of the station will be regulated from this station.

At the present time the current from the company's generating station is sent to the Vancouver substation and other substations at high voltage. When the new substation is completed the Vancouver station and other stations now connected with the transmission lines will be used as substations, receiving their current at 11,000 volts from the Burnaby station. In connection with the new arrangement the British Columbia Electric Railway will reconstruct its transmission system from the power house on the North Arm of Burrard Inlet to Burnaby to carry current at 60,000 volts. As soon as the Burnaby receiving station has been completed the company will erect a similar station near Sapperton, on the outskirts of New Westminster. The equipment of this plant will be almost identical with the Burnaby station, and the plans call for an expenditure of about \$200,000. From the Sapperton station power will be sent to the company's substations in the South Fraser Valley, which cover the supply of the Fraser Valley interurban line and the demands of private parties for light and power in the district. Arrangement has been made whereby in case of accident to the transmission line current from either the Burnaby or Hastings station may be supplied to any point in the company's territory.

The company is now erecting in Vancouver a substation to cover the west end of the city, the residential and the apartment house center. This building will be 60 ft. x 68 ft., one story in height, with an additional story for the transmission gallery, and fireproof throughout. Structural steel with brick curtain walls and a concrete roof are planned. The estimated expenditure on the station will be in the neighborhood of \$100,000. Current will be fed to this substation at 11,000 volts, and transmission lines will be arranged from the Vancouver substation as well as the Burnaby receiving station to afford an alternate base of supply in case of accident to either line. The electrical equipment of the Vancouver substation will consist of two 1000-kw motor-generator sets, consisting of 11,000-volt motors and 600-volt generators, this equipment regulating the current for the electric railways in the section. The station will also be equipped with one bank of three transformers of 7500 kw capacity to regulate the private and street lighting of the district.

New Road Opened in Tennessee.—The Nashville-Gallatin Interurban Railway has been placed in operation between Nashville and Gallatin.

Reply Soon to Demands of Akron Council.—Charles Curric, general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, stated recently that the company will reply shortly to the demand of the City Council of Akron for extension and improvements.

Ordinance with Service Requirement for Motormen Vetoed.—Mayor John J. Irving's veto of the ordinance requiring motormen and conductors to have at least fifteen days' experience on lines of the Binghamton (N. Y.) Railway before being allowed to operate cars has been sustained by the Council of Binghamton.

Cleveland Railway Removes Offices.—The Cleveland (Ohio) Railway has removed its offices from the Electric Building, Cleveland, to the seventh floor of the Leader-News Building on Superior Street. This is a new building which was erected by Dan R. Hanna, who controls both the Cleveland *Leader* and the Cleveland *News*.

Great Northern Railway Electrification Work.—According to statements recently made public the Great Northern Railway will begin the work of construction on the Chelan River power site by April 15. The power generated will be used by the company to operate the electrified line east of the Cascade Mountains to Spokane. Plans are being made to electrify the main line from Seattle to Spokane, but no details in regard to this work have been announced.

Maine Utility Bill Signed.—Governor Haines of Maine has signed the bill creating a public utility commission in that State and on March 28 made public his appointments to the commission, which is to consist of L. B. Deasy, Bar Harbor, chairman; W. B. Skelton, Lewiston, and Joseph Williamson, Jr., Augusta. Mr. Deasy and Mr. Skelton are Republicans and Mr. Williamson is a Democrat. All three are lawyers and have had considerable experience in corporation matters.

Proposed Line Between Battle Creek and Grand Rapids.—It is stated that the Michigan & Chicago Railroad, which proposes to construct an interurban electric railway between Battle Creek and Grand Rapids, Mich., has entered into negotiations with the Michigan Central Railroad looking to the electrification of a part of the Allegan division of the road and its operation in conjunction with the line which the Michigan-Chicago Railroad plans to build. H. H. Crowell, Grand Rapids, is president of the Michigan & Chicago Railroad.

Operation of Trailers Introduces New Problems.—The installation of trailers at Cleveland, Ohio, may affect the agreement between the Cleveland (Ohio) Railway and its employees. It has been necessary to have some of the motormen do part-time duty as conductors on the trailers. They object to this. It is said that under the agreement between the company and the men no change of duties can be made except on May 1 and then only when fifteen days' notice has been given by the party desiring the change. A committee has been appointed to formulate demands and the organization will vote on the question of reopening the agreement on May 1.

Great Demand for Linemen and Electricians in Devastated Districts.—Appeals have been sent out from the flood-stricken districts for all available linemen and electricians to aid in the work of making electrical repairs. There was a great deal of repair work to be done to electrical structures in a large area west of Chicago, owing to recent windstorms, and there is still more to be done in a still larger territory, generally east of Chicago, owing to the floods. As far as Duluth, Minn., the word was sent that "every man who can climb a telegraph pole and twist a wire is wanted at Dayton and other flooded cities in Ohio and Indiana." It is said that more than seventy-five men responded from Duluth alone.

Pleasing the Public.—The *Interborough Bulletin*, published in the interests of the employees of the Interborough Rapid Transit Company, New York, N. Y., contains in its March, 1913, issue two pages of letters from satisfied patrons of the company under the title "Pleasing the Public." These pages are illustrated with line cuts depicting the acts of courtesy and honesty on the part of the employees of the company which prompted the sending of

the letters to the company. They are a fine commentary on the efficiency and loyalty of the employees. The cover of the March issue of the *Interborough Bulletin* contains half-tone reproductions from five photographs showing the interior of the first of the employees' stores.

More Employees' Stores in New York.—The Interborough Rapid Transit Company and the New York Railways, New York, N. Y., have announced that two additional stores for their employees, at which groceries and other food stuff will be sold at cost, are to be opened about April 10. One of these stores is to be located immediately north of the northwest corner of Lexington Avenue and Ninety-eighth Street and the other at the southeast corner of Eighth Avenue and One Hundred and Fifty-second Street. As previously noted in the *ELECTRIC RAILWAY JOURNAL*, the first employees' store was opened at 816-818 Eighth Avenue on March 12. The extent to which it has been patronized by employees and their families has been beyond expectation.

City Planning in Montreal.—A general plan of public improvements for Montreal and the island of Montreal was discussed at the meeting of the Metropolitan Parks Commission recently. The commission is working on a general plan for Montreal and the island of Montreal, with a view of laying down certain lines of improvements which should be carried out during the next few years. Included in the details are provisions for streets, boulevards, playgrounds and an underground system of railways. Considerable discussion took place on the necessity of an underground railway in Montreal. The prevailing opinion was that such a system would undoubtedly be required in a few years. The suggestion submitted was that the underground should extend to full width of the street from the head of St. James Street at the Champ de Mars to Bonaventure station.

Transit Matters in Toronto.—It is reported that a settlement of the differences between the city and the Toronto (Ont.) Railway may be reached without recourse to the Ontario Railway & Municipal Board. The corporation counsel, however, has so far refused to confirm the terms which it is reported have been made with the company. The city is asking for more cars and for certain extensions of the lines. The portion of the report of the traffic expert of the city published some time ago recommended thirty-three additional lines for various parts of the city and six radial lines. The report also recommended a subway on Terauley Street from Queen Street to North Toronto with a loop at Richmond Street. The transportation committee has decided in favor of underground lines on Terauley Street and along Bloor Street to the Bloor Street viaduct to connect with the Danforth Avenue car line.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

MASSACHUSETTS

Representative Washburn has introduced into the House the bill enlarging the powers of the Railroad Commission to a membership of five under the name of the Public Transportation Commission. The bill provides that the board shall have jurisdiction over all transportation companies classified as railroads, electric railways, express companies and steamship lines, and transfers the regulation of telephone and telegraph companies to the proposed new board from the Massachusetts Highway Commission. The statute also provides that three members of the board shall constitute a quorum and that a quorum shall sit upon all contested matters. The commission is authorized to expend not more than \$150,000 annually in salaries, exclusive of the compensation of members of the board, and has greatly enlarged powers of inquiry and authority to employ expert assistance. It may appraise properties, pass upon security issues, institute investigations and prescribe rates, with the usual provisions regarding returns to be filed with the board. An enlargement of the board's powers is found in the provision that it may upon its own initiative institute inquiries into the reasonableness of rates. The bill gives the Supreme Court of the State jurisdiction in equity over decisions of the board in cases of appeal and of enforcement.

NEW JERSEY

Senator Pierce's indeterminate franchise bill has passed the Senate. The bill provides that hereafter every franchise or privilege granted by any municipality to any public utility shall be an indeterminate permit. The bill repeals the limited franchise act of 1906, the supplement thereto passed the same year; the supplement of May 8, 1907, providing that the limited franchise act shall not apply to second, third and fourth class counties, except in cities having a population of 12,000 or more, and the act of 1912 extending the limit of franchises that may be granted to fifty years.

OHIO

It is said that the arguments against the Mills public utilities bills have brought about a change of mind on the part of the Governor and that another bill may be formulated that will omit the objectionable portions. The proposed new bill will provide for the reorganization of the commission and for the valuation of all public service properties.

It is stated that the Supreme Court will be asked to interpret the home rule amendment, adopted last summer. Some members of the Legislature argue that it merely confers on cities the right to adopt their own form of government and that it was not meant to turn over all the powers the State had formerly exercised to municipalities. The public service companies have inquired whether the Public Service Commission or the municipal commission will have authority in a case where the property of a company lies partly within and partly without the boundaries of the municipality. The status has also been asked of an inter-city utility or a public service corporation that serves a number of cities, such as the interurban electric railways. Senator E. F. Weiser is reported to have said: "Home rule seems to shut the State out except when the home rulers want something. Then they come trotting up here to the General Assembly."

WISCONSIN

The Holmes bill providing for the joint use of a street railway tracks has been concurred in by the Senate and has been sent to Governor McGovern for final consideration. The bill gives the State Railroad Commission the right to declare for the joint use of tracks and also to fix what the commission considers a fair and equitable consideration for the use of the tracks. It will be particularly beneficial to interurban roads entering cities. The Legislature is now considering the numerous bills introduced during the last two months. Practically no measures are being introduced.

PROGRAM OF ASSOCIATION MEETING

American Society of Mechanical Engineers

The special committee on railroads of the committee of meetings of the American Society of Mechanical Engineers announces a meeting on steel passenger car design, to be held in the Engineering Societies Building, 29 West Thirtieth Street, New York, on April 8, 1913, at 8.15 p.m. sharp. The meeting is intended to bring before the society the latest development of the art by specialists in each feature of steel passenger car design. The program follows:

"Introduction to General Discussion of Steel Passenger Car Construction," H. H. Vaughn, assistant to vice-president Canadian Pacific Railway.

"Problems of Steel Passenger Design," W. F. Kiesel, Jr., assistant mechanical engineer Pennsylvania Railroad Company.

"Underframes for Steel Passenger Cars," J. McE. Ames, of American Car & Foundry Company.

"Roof Structure for Steel Cars," C. A. Seley, mechanical engineer Rock Island Lines.

"Suspension of Steel Cars," E. W. Summers, president Summers Steel Car Company.

"Six-Wheel Trucks for Passenger Cars," J. A. Pilcher, mechanical engineer Norfolk & Western Railway.

"Steel Interior Finish for Steel Passenger Cars," Felix Koch, assistant mechanical engineer Pressed Steel Car Company.

Financial and Corporate

Stock and Money Markets

April 2, 1913.

Trading on the New York Stock Exchange to-day was quiet and moderate losses were noted in most of the leading issues. The recession was regarded as natural after the recent upward tendency. There were, however, some strong features to-day. Brooklyn Rapid Transit, for instance, made a substantial advance on the strength of the revived rumors of a probable increase in the dividend rate. Interborough-Metropolitan preferred advanced a fraction and a moderate gain was made in Third Avenue Railway. Rates in the money market to-day were: Call, $3\frac{3}{4}$ @ $4\frac{1}{2}$ per cent; sixty days to six months, $4\frac{1}{2}$ @ $4\frac{3}{4}$ per cent.

The Philadelphia market was broad and active to-day. The price changes were very irregular. The demand for bonds was good.

The Chicago market was broad to-day, but the volume of transactions was small. There was little demand for bonds.

The Boston market was very irregular to-day and was much less active than for several days past.

In the Baltimore market the feature was the new high record established by the United Railways common and the 5 per cent notes of the company.

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

	Mar. 23.	April 2.
American Brake Shoe & Foundry (common).....	90½	90½
American Brake Shoe & Foundry (preferred).....	130½	130
American Cities Company (common).....	43	42
American Cities Company (preferred).....	71½	73½
American Light & Traction Company (common).....	345	400
American Light & Traction Company (preferred).....	105	107
American Railways Company.....	39	38½
Aurora, Elgin & Chicago Railroad (common).....	43½	43½
Aurora, Elgin & Chicago Railroad (preferred).....	37½	37½
Boston Elevated Railway.....	105½	106½
Boston Suburban Electric Companies (common).....	7½	7½
Boston Suburban Electric Companies (preferred).....	a66	*66
Boston & Worcester Electric Companies (common).....	7¼	7¼
Boston & Worcester Electric Companies (preferred).....	43	43
Brooklyn Rapid Transit Company.....	88¾	91
Capital Traction Company, Washington.....	120	121
Chicago City Railways.....	150	150
Chicago Elevated Railways (common).....	26	26
Chicago Elevated Railways (preferred).....	88	88
Chicago Railways, pteptg., ctf. 1.....	88	85
Chicago Railways, pteptg., ctf. 2.....	21¼	21¼
Chicago Railways, pteptg., ctf. 3.....	6	6½
Chicago Railways, pteptg., ctf. 4.....	*3½	*3½
Cincinnati Street Railway.....	*112	111
Cleveland, Southwestern & Columbus Ry. (common).....	*5½	*5½
Cleveland, Southwestern & Columbus Ry. (preferred).....	*30	*30
Cleveland Railway.....	103½	*103½
Columbus Railway & Light Company.....	*18	18
Columbus Railway (common).....	*69½	a69½
Columbus Railway (preferred).....	*82½	82½
Denver & Northwestern Railway.....	*108	*108
Detroit United Railway.....	74¼	80
General Electric Company.....	137½	140¾
Georgia Railway & Electric Company (common).....	118	119
Georgia Railway & Electric Company (preferred).....	84	83¾
Interborough Metropolitan Company (common).....	16¾	17¾
Interborough Metropolitan Company (preferred).....	58	60
International Traction Company (common).....	*35	*35
International Traction Company (preferred).....	*95	*95
Kansas City Railway & Light Company (common).....	15	15
Kansas City Railway & Light Company (preferred).....	*30	*30
Lake Shore Electric Railway (common).....	*6½	*6½
Lake Shore Electric Railway (1st preferred).....	*91	*91
Lake Shore Electric Railway (2d preferred).....	*25½	*25½
Manhattan Railway.....	127	128½
Massachusetts Electric Companies (common).....	16½	17½
Massachusetts Electric Companies (preferred).....	74	75½
Milwaukee Electric Railway & Light Co. (preferred).....	*100	*100
Norfolk Railway & Light Company.....	*25¾	*25¾
North American Company.....	75	77
Northern Ohio Light & Traction Company (common).....	70½	75
Northern Ohio Light & Traction Company (preferred).....	*105	105
Philadelphia Company, Pittsburgh (common).....	44½	43½
Philadelphia Company, Pittsburgh (preferred).....	40	33¼
Philadelphia Rapid Transit Company.....	24½	26
Portland Railway, Light & Power Company.....	*67	*67
Public Service Corporation.....	115	114
Third Avenue Railway, New York.....	36¾	37¾
Toledo Railways & Light Company.....	2½	2½
Twin City Rapid Transit Co., Minneapolis (common).....	103½	105½
Union Traction Company of Indiana (common).....	*4½	*4½
Union Traction Company of Indiana (1st preferred).....	*81	*81
Union Traction Company of Indiana (2d preferred).....	*34	*34
United Rys. & Electric Company (Baltimore).....	23½	27
United Rys. Inv. Company (common).....	27½	27¾
United Rys. Inv. Company (preferred).....	50½	49½
Virginia Railway & Power Company (common).....	51¾	52
Virginia Railway & Power Company (preferred).....	89	92
Washington Ry. & Electric Company (common).....	94	91¾
Washington Ry. & Electric Company (preferred).....	89	90¾
West End Street Railway, Boston (common).....	76	78
West End Street Railway, Boston (preferred).....	a95	a96
Westinghouse Elec. & Mfg. Company.....	63½	66
Westinghouse Elec. & Mfg. Company (1st preferred).....	116	115

*Last sale. a Asked.

ANNUAL REPORTS

Georgia Railway & Power Company

The Georgia Railway & Power Company, Atlanta, Ga., reports earnings as follows for the year ended Dec. 31, 1912:

Gross earnings	\$5,218,913
Operating expenses	2,427,621
Net operating revenue.....	\$2,791,291
Less taxes	349,198
	<u>\$2,442,093</u>
Dividend on treasury stock.....	\$41,168
Other miscellaneous income	36,109
	<u>77,277</u>
	<u>\$2,519,370</u>
Less interest on bonds	\$751,844
Less interest on notes.....	7,342
	<u>759,187</u>
	<u>\$1,760,183</u>
Less rental dividends on Georgia Railway & Electric Company and Atlanta Gas Light Company stock.....	801,168
	<u>\$959,015</u>

H. M. Atkinson, chairman, and P. S. Arkwright, president, say in part:

"All of the properties statements of whose operations are included were not in operation during 1911, and consequently it is impracticable to attempt to give comparative figures. After the payment of operating expenses, taxes, interest and sinking funds on the bonds of the Atlanta Water & Electric Power Company, the Blue Ridge Electric Company and the Savannah River Power Company, and the rentals, consisting of the taxes, interest, sinking funds and dividends of the Georgia Railway & Electric Company, the surplus earnings of the consolidated properties for the calendar year amounted to \$874,689.

"A dividend on the \$2,000,000 of first preferred stock of the company accruing from the date of its issuance, March 18, 1912, at the rate of 6 per cent per annum to Jan. 1, 1913, and amounting to \$94,000, or 4.7 per cent, was declared and paid. A dividend amounting to \$30,000 on the common stock of the Atlanta Water & Electric Power Company was declared and paid by that company prior to the conveyance of its property to this company and covered the period from the payment of the last dividend on such stock to the date of such conveyance.

"The surplus for the calendar year, after the payment of all charges, rentals and dividends in respect to the consolidated properties, amounted to \$750,689. The surplus earnings of the Georgia Railway & Power Company for the period from March 18, 1912, to Dec. 31, 1912, amounted to \$505,447, which has been credited to profit and loss.

"The construction of the hydroelectric development at Tallulah Falls and of the transmission lines and substations in connection therewith has continued during the year under the contract made before the formation of this company between the Georgia Power Company and the Northern Contracting Company. Payment for this work is being made out of the proceeds of the sale of \$8,315,000, par value, of Georgia Power Company bonds set aside for this purpose. The interest on these bonds is paid as a part of the construction cost. This work is proceeding as satisfactorily as is reasonably practicable and is expected to be completed during 1913. This is the principal hydroelectric development of the company, and the company will not receive the benefit of any earnings from this source until the latter part of the year 1913.

"Charges to construction for 1912 for additions to the property of the Georgia Railway & Power Company other than the work being done by the Northern Contracting Company above referred to aggregate \$145,107.

"Expenditures for additions to the property of the Georgia Railway & Electric Company, including the Atlanta Gas Light Company, during 1912 and charged to construction aggregate \$1,250,864.44.

"As part payment, in accordance with the lease, on account of expenditures made for additions to the property of the Georgia Railway & Electric Company, the \$250,000, par value, refunding and improvement mortgage bonds of the Georgia Railway & Electric Company in its treasury at the date of the lease were sold and the proceeds applied

toward reimbursing this company on account of such expenditures. The balance of such expenditures, it is contemplated, will be reimbursed from additional refunding and improvement mortgage bonds of the Georgia Railway & Electric Company. In accordance with the sinking fund provisions of the respective mortgages, \$25,000, par value, bonds of the Atlanta Consolidated Street Railway, \$25,990, par value, first consolidated mortgage bonds of the Georgia Railway & Electric Company and \$20,000, par value, refunding and improvement mortgage bonds of the Georgia Railway & Electric Company were redeemed and canceled, and the sum of \$7,590 was paid into the sinking fund under the mortgage of the Atlanta Gas Light Company and the sum of \$5,000 was paid into the sinking fund under the mortgage of the Atlanta Water & Electric Power Company. All rentals due the Georgia Railway & Electric Company under the lease covering this property were duly and promptly paid.

"On Dec. 31, 1912, the total mileage of railway tracks (on a single-track basis) controlled and operated by the company was 198,785. During the year 4,553 miles of new track were built and 1,073 miles of track were abandoned and taken up.

"The construction of the interurban railway from Decatur to Stone Mountain was entered upon and it is expected that same will be completed and put in operation during 1913.

"The properties formerly belonging to the Georgia Power Company, the Atlanta Water & Electric Power Company, the Interstate Power Company, the Savannah River Power Company and the Atlanta Hydroelectric Company were conveyed to the Georgia Railway & Power Company, and a lease of the properties and franchises of the Georgia Railway & Electric Company for a term of 999 years was executed and delivered to the Georgia Railway & Power Company, and the Georgia Railway & Power Company has entered into the possession and control of all of the properties so conveyed and leased

"Beginning Jan. 1, 1913, in accordance with the contract entered into with the city of Atlanta by which the city consented to the lease of the Georgia Railway & Electric Company, a reduction in the rates charged for electric light and power in the city of Atlanta became effective.

"The rate of wages paid motormen and conductors of the company has been voluntarily increased approximately 10 per cent, such increase becoming effective Jan. 1, 1913."

Chicago City Railway

The income account of the Chicago (Ill.) City Railway for the year ended Jan. 31, 1913, follows:

GROSS EARNINGS	
Passenger receipts, including Southern Street Railway.....	\$10,838,713
Receipts from other sources.....	405,267
	\$11,243,981
TOTAL EXPENSES	
*Operating expenses, taxes and renewals, of combined systems, interest on capital investment of Chicago City Railway and net earnings of Southern Street Railway.....	9,485,823
Net earnings of Chicago City Railway.....	\$1,758,158
City's proportion, 55 per cent, as per ordinance.....	966,987
Company's proportion, 45 per cent, as per ordinance....	\$791,171
Interest on capital, as certified by board of supervising engineers	2,217,265
Income from operation	\$3,008,436
Other income, net	260,172
	\$3,268,608
Interest on bonds outstanding	1,286,102
Net income	\$1,982,506
Regular dividend, 10 per cent.....	1,800,000
	\$182,506
Surplus for twelve months ended Jan. 31, 1913.....	\$182,506
Percentage of net income to capital stock at par.....	11.01

*Includes contingent reserve fund of \$60,000 to apply on account of increase in wages of trainmen and barnmen from Aug. 1, 1912, to Feb. 1, 1913, as a result of the arbitration still pending on Jan. 31, 1913.

L. A. Busby, president, says in part:

"Your property has produced a net income of \$1,982,506, from which four quarterly dividends of 2½ per cent have been paid, aggregating a total of 10 per cent upon the \$18,000,000 capital stock, and leaving \$182,506 surplus earnings for the year.

"Sufficient reserves having been set aside under the provisions of the 1907 ordinance to provide for the maintenance and renewal of the property, it was decided by your board of directors to distribute from earnings an extra dividend of 1 per cent upon the capital stock. The balance in surplus account at the close of the fiscal year was \$12,114.

"During the year the company has built and acquired by purchase, authorized by ordinance, 25.42 miles of single track. The total mileage of single track now owned is 292.07 miles.

"The three-year contract with the employees expired on Aug. 1, 1912. Negotiations for a new contract resulted in a tentative agreement between the company and association, dated Aug. 24, 1912. This agreement was submitted to a vote of the men and rejected by them. Thereupon the company and the association entered into an agreement to arbitrate all questions in controversy. The company appointed as its representative H. B. Fleming, our vice-president; the association appointed Judge Kickham Scanlan, of the Circuit Court of Cook County, and the two so appointed selected Judge Orrin N. Carter, of the Supreme Court of Illinois, as the third member of the board of arbitrators. The board handed down its findings on March 29, 1913, giving the men an approximate increase of 2 cents per hour, to take effect as of Aug. 1, 1912."

Duluth-Superior Traction Company

The annual report of the Duluth-Superior Traction Company, Duluth, Minn., for the year ended Dec. 31, 1912, compares as follows with the previous year:

	1912	1911
Gross earnings	\$1,083,259	\$1,135,299
Operating expenses	630,187	608,135
	\$453,071	\$527,164
Net earnings	\$453,071	\$527,164
Taxes, interest and dividends.....	454,295	443,161
	\$1,224*	\$84,003
Depreciation appropriation	70,114	58,288
	\$71,338*	\$25,715

*Deficit 1912.

C. G. Goodrich, the president of the company, said in part:

"The deficit for the year 1912 is the result of the carmen's strike during September and October. On Sept. 9 your company was forced into a controversy with union labor and suffered from an expensive strike. Union labor organizers, entirely outside the ranks of the company's employees, made a determined effort and partially succeeded in organizing the company's employees.

"The new organization made a demand in the middle of the night for the reinstatement of a number of undesirable employees who had been discharged and, upon this demand not being immediately granted, called a strike to take effect the following morning. By means of the usual tactics and with the assistance of unrestrained violence, which broke out on the first evening, all but about sixty of the conductors and motormen were either drawn into the new organization or temporarily driven from their positions by fear.

"To have yielded to the demands of the new organization would have been unfair to 90 per cent of the loyal employees of the company, who appeared to be as much averse to being put under the control of union labor leaders as the company was.

"The directors, believing that it was necessary to meet the issue squarely and make the company's position perfectly clear to all concerned, instructed the management to stand firmly for the open shop principle for which the citizens of Duluth had already waged one expensive struggle.

"The strike lasted from Sept. 9 to Nov. 6, being officially declared off on the latter date, but normal earnings were not completely restored until about Dec. 1.

"Your directors believe that the company must control the selection of employees for whose acts it is alone responsible to the public. This is the first labor trouble the company has experienced since 1899.

"All damage to property during the strike has been fully repaired. New cars, construction and extensions of the system aggregating \$180,022 have been added during the year as follows:

New cars and equipment.....	\$75,287
New track	66,547
Conduit and feed wires	18,301
Real estate and buildings	14,570
Miscellaneous	5,317
Total	\$180,022

"There was expended for renewals and charged against depreciation reserve \$45,067. The appropriation to depreciation reserve for the year was \$70,114. Depreciation reserve now amounts to \$310,269.

"During the year 276 general mortgage twenty-year 5 per cent gold bonds of the Duluth Street Railway have been authenticated by the trustee and sold and the proceeds applied against the cost of construction, new cars, etc.

"Regular quarterly dividends of 1 per cent upon the preferred stock and 1¼ per cent upon the common stock of your company have been declared and paid."

Athol & Orange Street Railway, Athol, Mass.—The Railroad Commission has approved the petition of the Athol & Orange Street Railway for authority to issue 905 shares of common stock and 1500 shares of 6 per cent cumulative stock of a par value of \$100, proceeds to be used to pay indebtedness incurred in the purchase of the Templeton Street Railway.

Belt Line Railway Corporation, New York, N. Y.—The Belt Line Railway Corporation, the successor to the Central Park, North & East River Railroad, has elected officers as follows: Frederick W. Whitridge, president; Edward A. Maher, vice-president and general manager; Frederick J. Fuller, secretary; Alfred D. Sage, treasurer; Reune Martin, auditor; James F. Feely, assistant secretary and assistant treasurer.

Berkshire Street Railway, Pittsfield, Mass.—The Railroad Commission of Massachusetts has approved the petition of the Berkshire Street Railway for authority to issue 10,000 shares of additional capital stock, of a par value of \$100.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has petitioned the Railroad Commission for authority to issue \$150,000 of 4½ per cent twenty-year first mortgage gold bonds.

Brooklyn (N. Y.) Rapid Transit Company.—Application has been made to the Public Service Commission of the First District of New York by the Coney Island & Gravesend Railway, a subsidiary of the Brooklyn Rapid Transit Company, for permission to buy all or any part of the shares of the Coney Island & Brooklyn Railroad, which has been operated for many years as the only independent railway of importance in Brooklyn outside of the Brooklyn Rapid Transit System. The Coney Island & Brooklyn Railroad has \$2,983,900 of stock outstanding. About a year ago it was understood that the Hyde estate had parted with 25,000 shares of the stock, and a few weeks ago it became known that 25,531 shares of the stock were held in trust in the name of W. H. Ludlum, who is connected with the Central Trust Company. At the present time the Coney Island & Gravesend Railway proposed to buy about 25,841 shares of stock of the Coney Island & Brooklyn Railroad and to take up at par as many of the remaining shares as may be offered. To finance the purchase the Coney Island & Gravesend Railway has also asked the commission to authorize the company to pledge the acquired stock and its own property as collateral for ten-year 6 per cent notes up to the amount of \$2,983,900, subject to redemption at sixty days' notice at their face value and accrued interest.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky.—Julius Fleischmann, Cincinnati, has been succeeded as a director of the Cincinnati, Newport & Covington Light & Traction Company by James Ellis, Cincinnati.

Columbus Railway & Light Company, Columbus, Ohio.—It is announced that the Public Service Commission of Ohio will act on the application of the Columbus Railway & Light Company for permission to consolidate its various subsidiaries as soon as Linden G. White, engineer for the commission, has completed the investigation which he is making of the affairs of the company.

Kansas City, Ozark & Southern Railway, Ava, Mo.—

A. P. Miller and J. A. Reynolds have been appointed receivers of the Kansas City, Ozark & Southern Railway on the application of the Ozark Construction Company, which has begun suit against the railroad to recover for work done in constructing the line. The road has been in operation for some time between Ava and Mansfield, 8 miles distant. J. B. Quigley has been named by the receivers to manage the road.

New York, New Haven & Hartford Railroad, New Haven, Conn.—Lewis Cass Ledyard has resigned as a director of the New York, New Haven & Hartford Railroad.

Northern Electric Railway, Chico, Cal.—The order of the Railroad Commission of California authorizing the Vallejo & Northern Railroad to sell its property to the Northern Electric Railway, referred to in the *ELECTRIC RAILWAY JOURNAL* of March 1, 1913, page 306, follows in part: "The Railroad Commission does hereby authorize the applicant (Vallejo & Northern Railroad) to sell, assign, and dispose of the whole of its railroad system, property, franchises and permits as more fully described and set out in an indenture made and entered into Jan. 21, 1913, between the Vallejo & Northern Railroad and the Northern Electric Railway. Said transfer shall be made upon the terms and conditions set out in an agreement made and entered into on Jan. 21, 1913, between the Vallejo & Northern Railroad and the Northern Electric Railway. Said property to be transferred free of incumbrances, except that the Northern Electric Railway is to assume all outstanding obligations of applicant for the payment of all amounts remaining due for said real property or rights-of-way upon which payment in part has been made by applicant, provided that as a condition precedent to the effectiveness of this order applicant shall enter into an agreement, to be approved by this commission, with said Northern Electric Railway, by which agreement it shall be provided that in the event that the bonds delivered to applicant in consideration of the transfer of the property herein mentioned shall be sold within a reasonable time for more than 80 per cent of their face value, the money above 80 per cent of the face value received on the sale of said bonds shall be immediately delivered to said Northern Electric Railway."

Pennsylvania Railroad, Philadelphia, Pa.—The directors of the Pennsylvania Railroad have approved the proposed long-term lease of the West Jersey & Seashore Railroad on terms prescribed by that company, namely, a guaranteed rental of 6 per cent per annum on the common stock and the interest on its bonds, taxes and other fixed charges. The lease is to become effective July 1, 1913. On July 1 a dividend of 1½ per cent in cash will be paid to common stockholders. The lease will be submitted for approval to the West Jersey & Seashore Railroad at a special meeting on April 30.

Petaluma & Santa Rosa Railway, Petaluma, Cal.—The Petaluma & Santa Rosa Railway has applied to the Railroad Commission of California for authority to issue \$80,000 of bonds and \$64,000 of notes, the proceeds to be used to construct an electric railway from Liberty to Two Rock.

Poland (Ohio) Street Railway.—The Poland Street Railway has been authorized by the Public Service Commission of Ohio to issue capital stock of the par value of \$50,000 and twenty-year 5 per cent gold bonds of the par value of \$200,000 at not less than 85, the proceeds to be used in the construction and equipment of an interurban electric railway between Central Square, Youngstown, and the village of Poland, a distance of 4.7 miles.

Reading Transit & Light Company, Reading, Pa.—A charter has been granted in Delaware to the Reading Transit & Light Company with a capital stock of \$4,150,000. This is the new lessee of the Reading group of the Interstate Railway properties and is part of the plan of the Eastern Power & Light Corporation to take over a number of electric railway and light properties, including the Reading Transit Company, the United Traction Company of Reading, the Lebanon Valley Street Railway and others, as mentioned in the *ELECTRIC RAILWAY JOURNAL* for March 15, 1913, page 532.

Toledo Railways & Light Company, Toledo, Ohio.—The reorganization committee of the Toledo Railways & Light Company announces that the voting trust certificates for

the common and preferred stocks of the Toledo Traction, Light & Power Company are now ready in temporary form and will be delivered to depositing stockholders by the New York Trust Company upon surrender of the certificates issued for the deposit of Toledo Railways & Light Company stock. Fractional certificates of interest will be issued for new stock of less amounts than \$100 par value, convertible into voting trust certificates of the company when surrendered by the holders in aggregate amounts of \$100 or multiples.

Dividends Declared

Auburn & Syracuse Electric Railroad, Syracuse, N. Y., quarterly, 1½ per cent, preferred.
 Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., quarterly, 1½ per cent, preferred.
 Boston (Mass.) Suburban Electric Companies, quarterly, \$1, preferred.
 Cincinnati, Newport & Covington Light & Traction Company, Cincinnati, Ohio, quarterly, 1⅛ per cent, preferred; quarterly, 1¾ per cent, common.
 Kokomo, Marion & Western Traction Company, Kokomo, Ind., quarterly, 1¼ per cent, preferred.
 Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred.
 Springfield & Xenia Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.
 Washington, Baltimore & Annapolis Electric Railroad Company, Baltimore, Md., quarterly, 1½ per cent, preferred.
 Washington Railway & Electric Company, Washington, D. C., quarterly, 1½ per cent, common.
 Youngstown & Ohio River Railroad, Youngstown, Ohio, quarterly, three-quarters of 1 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

JACKSONVILLE (FLA.) TRACTION COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Jan., '13	\$49,823	*\$33,567	\$16,256	\$11,037	\$5,219
1 " " '12	49,878	*31,948	17,930	9,275	8,655
12 " " '13	562,482	*380,131	182,352	120,751	61,601
12 " " '12	564,660	*349,437	215,223	101,222	114,001

NEW YORK (N. Y.) RAILWAYS

1m., Feb., '13	\$1,074,890	\$597,575	\$477,315	\$373,879	\$103,435
1 " " '12	1,063,340	657,364	405,976	366,188	39,788
8 " " '13	9,562,410	5,253,184	4,309,226	3,700,350	608,876
8 " " '12	.....	.....	.....	.....	.....

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Jan., '13	\$137,048	*\$93,973	\$63,075	\$24,037	\$38,238
1 " " '12	114,695	*70,842	43,852	20,846	23,006
12 " " '13	1,833,115	*964,820	868,295	270,065	598,230
12 " " '12	1,613,561	*887,282	726,279	251,038	475,241

PADUCAH LIGHT & TRACTION COMPANY, PADUCAH, KY.

1m., Jan., '13	\$26,666	*\$17,227	\$9,439	\$7,335	\$2,104
1 " " '12	24,694	*18,313	6,381	7,073	792
12 " " '13	288,509	*191,589	96,921	86,615	10,306
12 " " '12	268,202	*166,307	101,895	81,653	20,242

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Jan., '13	\$26,317	*\$16,480	\$9,838	\$6,301	\$3,537
1 " " '12	22,261	*15,418	6,843	6,377	466
12 " " '13	289,485	*177,521	111,965	76,393	35,572
12 " " '12	286,608	*180,463	106,145	62,823	43,322

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Jan., '13	\$701,640	*\$437,914	\$263,726	\$165,797	\$97,929
1 " " '12	720,786	*412,354	308,433	153,465	152,968
12 " " '13	8,294,702	*2,797,859	3,496,843	1,986,582	1,510,261
12 " " '12	.....	.....	.....	.....	.....

SAVANNAH (GA.) ELECTRIC COMPANY

1m., Jan., '13	\$67,792	*\$50,077	\$17,716	\$17,710	\$6
1 " " '12	56,359	*42,399	15,960	15,956	4
12 " " '13	756,492	*558,730	197,762	196,548	1,214
12 " " '12	701,224	*515,261	185,963	184,812	1,151

TAMPA (FLA.) ELECTRIC COMPANY

1m., Jan., '13	\$68,157	*\$34,738	\$33,419	\$4,794	\$28,625
1 " " '12	60,752	*32,448	28,304	4,551	23,753
12 " " '13	761,241	*396,920	364,320	53,999	310,321
12 " " '12	698,851	*380,038	318,813	59,210	259,603

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Feb., '13	\$635,321	*\$354,258	\$281,063	\$140,094	\$140,969
1 " " '12	616,536	*340,750	275,786	143,079	132,708
2 " " '13	1,325,831	*730,016	295,815	288,669	307,146
2 " " '12	1,252,944	*705,683	546,361	283,158	263,203

*Includes taxes. †Deficit.

Traffic and Transportation

Statement by Rhode Island Company of Its Attitude Toward Organization of Employees

A note in part as follows had been addressed to the employees of the Rhode Island Company, Providence, R. I., over the signatures of D. F. Sherman, vice-president, and A. E. Potter, general manager:
 "During the past few weeks our attention has been directed to the fact that an attempt was being made secretly to unionize the employees of this company. A considerable number of employees have expressed themselves as strongly in favor of the continuance of their present relations with the company and their membership in the Mutual Aid Association, as against the organization of a union. Under the mutual agreement, in connection with such Mutual Aid Association, the company has paid out during the last eleven years approximately \$250,000 on account of sick benefits and pensions for employees and in part consideration thereof the employees of the transportation department gave their signed agreement to refrain from joining a labor union while in the employ of the company. A violation of this agreement will require dismissal from service or discontinuance of the Mutual Aid Association, as in the judgment of the company may be for the best interest of all concerned. The company has always maintained a standard of wages equal to that of any other similar property in this territory, and wages have been advanced from time to time without either request or suggestion from the employees, and the same policy will be pursued in the future, under the conditions which have existed heretofore. The management of the company feels that it would be for the best interests of the employees and the company to continue the present relations, but should a majority of the employees decide at any time that their interests would be better protected by the organization of a union and the dissolution of the Mutual Aid Association, the proper method would be for that majority to request the company to release it from the present agreement and discontinue the Mutual Aid Association. On the other hand, should the majority desire a continuance of the present relations, it would be the duty of the company to protect that majority's interest in the Mutual Aid Association."

Letter from Dairymen Complimenting the Chicago, Ottawa & Peoria Railway

A letter has been written to the Chicago, Ottawa & Peoria Railway by the officers of the Illinois Dairymen's Association and representatives of the different State institutions commending the action of the officers of the company in endeavoring to promote the dairy interests in the community served by the railway. The special service furnished by the railway was operated over the line on Feb. 28 and March 1, 1913. There were eight speakers on board the car, which carried a number of exhibits. The letter to the company from the dairymen follows:

"By request of the men who accompanied the 'Dairy Special' over your line and in behalf of the dairymen in the section as well as the dairy interests of Illinois, we desire to express the highest appreciation of the innovation on the part of your company and especially the courtesy extended us on that trip by your representative.

"Your road is one of the first electric railways to manifest an interest in a substantial way in the advancement of the agricultural interests of your patrons, and I am sure you will be rewarded. The greatest civilizer and the most certain forerunner of prosperity is the railroad, and we do not hesitate to say that in this particular the electric railway is pre-eminent.

"When large corporations such as yours anticipate the people's needs and show by their actions that their motto is 'The greatest good to the greatest number,' then will a spirit of corporations be encouraged and the benefit be mutual. All prejudice will be removed. Antagonism will subside and a community of interest will be maintained to the satisfaction of everybody. When we can be of service to you do not hesitate to command us."

Increase in Wages.—An increase averaging 5 per cent has been made in the wages of the employees of the operation department of the Philadelphia & Westchester Traction Company, Upper Darby, Pa., effective on April 1.

Near-Side Stops in Spokane.—The officers of the Spokane Traction Company and the Washington Water Power Company, Spokane, Wash., arranged with the Spokane City Commissioners to stop their cars on the near side of the street after April 1, 1913, in the paved district.

Re-routing Suggested in Nashville.—The Nashville Railway & Light Company, Nashville, Tenn., following the action of that municipality in issuing bonds valued at \$400,000 for the erection of a new city hall, has been asked to re-route its lines so that every car will pass the Public Square.

St. Louis Car Service Bill Defeated.—The City Council of St. Louis on March 25, 1913, voted against the bill to provide for the addition of 330 cars to the service of the United Railways and for other changes in the methods of operation based on the report of the Public Service Commission of St. Louis. The original bill was then reintroduced in the House of Delegates and it was hoped to present it again to the Council.

New Passenger Tariff on Long Island Railroad.—The Long Island Railroad has received permission from the Public Service Commission for the First District to put into effect immediately a new tariff of passenger fares to and from Union Hall Street station at Jamaica. The new tariff will have the effect of making the rates to and from that station the same as the existing rates to and from the Jamaica station. The new rates between Union Hall Street station and the Pennsylvania Station in Manhattan will be as follows: Ten-trip ticket, \$2.45; twenty-trip ticket, \$4.80; fifty-trip ticket, \$11.00; sixty-trip monthly ticket, \$8.00; forty-six-trip school monthly ticket, \$6.15.

Service Questions in Atlanta.—In compliance with an order from the Georgia Railroad Commission, the Georgia Railway & Power Company, Atlanta, has filed with the commission a detailed statement of the company's lines and their operation. The company has been ordered by the commission to establish the following schedule on the Ponce de Leon Avenue line: From 6.30 a.m. to 7 p.m. cars every ten minutes, and at all other hours, cars every twenty minutes. The commission ordered several weeks ago that the ten-minute schedule should obtain from 6.30 a.m. to 9 a.m., from noon to 3 p.m. and from 4.30 p.m. to 7 p.m., and that a fifteen-minute schedule should obtain during other hours. A new order, directing the ten and twenty-minute schedules, has since been issued.

Report on Traffic Congestion in Newark.—G. B. Ford and E. P. Goodrich, the experts employed by the City Planning Commission of Newark, N. J., have presented to Mayor Haussling of that city a report in which they recommend that the congestion of traffic in the center of the city should be relieved. A conference between the city officials and the officers of the Public Service Railway is suggested looking to the relief of congestion at Broad and Market Streets. According to the Newark *Call*, the report of Messrs. Ford and Goodrich and the more detailed reports submitted by their associates, Harland Bartholomew and F. Van Zandt Lane, lay the blame for the congestion largely to the lack of co-operation on the part of the citizens with the company.

All-Day Express Service in Denver.—The Denver (Col.) City Tramway has established all-day express service on its Montclair and Aurora lines. The new service is operated continuously from 7 a.m. until 8 p.m., almost entirely within the corporate limits of the city. It introduced also the skip-stop system between Fillmore Street and the ends of the two lines. Under the skip-stop system all Montclair and Aurora cars east of Fillmore Street stop only at every second block, outgoing and incoming cars alternating. The limited express service previously in effect on these lines, which was operated between 7 a.m. and 9 a.m. and 4 p.m. and 6.15 p.m., except Sundays, provided for stops at all streets between the central loop and Broadway and east of Broadway at every fourth block to and including Fillmore Street.

Baltimore Suburban Rate Case Settled.—The controversy over commutation rates on the suburban lines of the United Railways & Electric Company, Baltimore, Md., has been closed, the Public Service Commission having dismissed the petition of the Woodlawn Improvement Association for an opportunity to show cause why the order issued on Dec. 24, 1912, shall be modified. The commission has approved the agreement entered into by the company and a committee representing the improvement and protective associations of Baltimore County concerning terms under which commutation books are to be issued. The agreement between the commuters' committee and the company was held by the commission to be "for the public interest." The agreement modifies the commutation terms prescribed in the commission's order.

Annual Passes Suggested in Toronto.—R. J. Fleming, manager of the Toronto (Ont.) Railway, has replied in part as follows to the request of Commissioner Harris in regard to the attitude of the company in the matter of issuing annual passes: "The rates of fare to be charged by this company were settled by the City Council at the time the franchise was sold. Consequently we have no power to depart from these rates. However, if the Council would like to make a change, I should prefer that the members of Council discuss the question among themselves and after they have concluded that the charge proposed would be in the best interests of the citizens, we will do our best to comply with the judgment of the Council. Of course, the rate proposed to be charged for annual passes would influence us very largely in considering the question."

Electric Railway Luncheon Club in Vancouver.—The members of the Social Club connected with the office organization of the British Columbia Electric Railway Company, Ltd., Vancouver, B. C., have organized a luncheon club to furnish a daily luncheon at moderate cost to its members. The management of the company loaned the club the entire initial outfit, including the full equipment for a gas kitchen, china, cooking utensils, furniture, etc., and provided the funds for alterations incident to the arrangement of the kitchen and dining room, the outlay being about \$1,500. The Social Club gave part of its games room for use as a kitchen and the rest of this room is used during the lunch hour for dining quarters, the room being changed again for the purpose of games at night. The price charged for meals is \$1 for the five days of the week. Tickets are not sold for less than one week. The government of the club is in the hands of a committee of five, which includes a representative of the company and a representative of the Social Club. A chef and helper are the only salaried employees, the lunch room being arranged on the cafeteria plan, each member waiting upon himself. The plan has now been in operation for several weeks and the results seem to indicate that it will be successful.

"Safety First" Campaign in Toledo.—E. R. Kelsey, manager of the passenger and publicity departments of the Toledo Railways & Light Company, Toledo, Ohio, has been appointed chairman of the first "safety first" league to be organized in Toledo. The Toledo Railways & Light Company proposes to conduct a "safety first" campaign with its inspectors, in its carhouses with its employees, in the schools, in the newspapers and in its cars. For the next few weeks it intends to install a series of twenty-five posters in its cars, changing the posters every other day for about six weeks. In commenting on the plan of the company Mr. Kelsey said: "Of course no move like this can be successful if the public does not assist, for figures show that almost 85 per cent of street car accidents are due to carelessness of the public. The company is preparing a series of twenty-five car posters concerning the 'safety first' idea which will be placed in all cars for the next few weeks. The company recently distributed 'Accident Don'ts' for the children to the schools. Very soon the children will start playing marbles, baseball, spinning tops and roller skating on streets, and this is believed the most opportune time for the formation of a 'Safety First' League." The league will endeavor to secure the co-operation of automobile drivers and owners by having them bring machines to a dead stop before passing an electric railway car that is taking on or discharging passengers."

Personal Mention

Mr. R. J. Smith, formerly with J. G. White & Company, Inc., New York, N. Y., has been appointed chief engineer of the Tri-City Railway & Light Company, which operates more than 120 miles of railway.

Mr. Gaylord Thompson, formerly chief engineer of the Ohio Electric Railway, with headquarters at Springfield, Ohio, has resigned to become vice-president and general manager of the New Jersey & Pennsylvania Traction Company, Trenton, N. J.

Mr. A. J. Davis has been appointed chief clerk to Mr. H. S. Potter, superintendent of the El Paso (Tex.) Electric Railway, to succeed Mr. W. V. Neal, who has been appointed superintendent of the interurban electric railway under construction between Beaumont and Port Arthur, by Stone & Webster.

Mr. W. V. Neal has been appointed superintendent of the interurban electric railway being built by Stone & Webster between Beaumont and Port Arthur, which will be controlled by the Beaumont-Eastern Texas Electric Company. Mr. Neal has been chief clerk to Mr. H. S. Potter, superintendent of the El Paso (Tex.) Electric Railway.

Mr. W. O. Ingle has been appointed auditor of the Rochester lines of the New York State Railways. Mr. Ingle has been connected with this company and its subsidiaries for the past nineteen years as bookkeeper, chief clerk and assistant auditor. Mr. Ingle has presented several papers at the meetings of the New York Electric Railway Association.

Mr. Frank B. Lasher was on April 2, 1913, appointed auditor of the New York State Railways and the Mohawk Valley Company with headquarters at the Grand Central Terminal, New York, N. Y. Mr. Lasher has been connected with electric railways, gas and electric light properties for fifteen years. He started as bookkeeper of the Albany & Hudson Railway & Power Company, in which capacity he served for three years and was then appointed assistant auditor. He resigned his connection with that company in 1904 to become auditor of the Oneonta, Cooperstown & Richfield Springs Railway. In 1906 he was appointed secretary, treasurer and auditor of the railway, lighting and gas properties at Pottsville, Pa., controlled by J. G. White & Company, Inc. In 1907 he became connected with the New York State Railways and the Mohawk Valley Company as chief accountant and statistician to Mr. A. L. Linn, Jr., then general auditor of the company. Mr. Lasher has served on important committees of the American Electric Railway Accountants' Association and is now third vice-president of the association and co-chairman of the joint committee on engineering accounting and a member of the committee on education.

Mr. B. S. Josselyn resigned as president of the Portland Railway, Light & Power Company, Portland, Ore., on April 3, 1913, effective on July 1, 1913. Mr. Josselyn has been president of the Portland Railway, Light & Power Company, Portland General Electric Company, Portland Railway, Oregon Water Power & Railroad Company, Union Traction Company, Portland & Sandy River Electric Company, Willamette Falls Company, Cazadero Real Estate Company and Kenton Construction Company since July 1, 1907. His resignation was accepted with regret by the directors. Mr. Josselyn was born at Heyworth, Ill., on Feb. 7, 1858. He left school at the age of fourteen and entered railroad service as a ticket clerk, advancing through a number of positions during the following years. In 1893 he was appointed general manager of the Kansas City, Osceola & Southern Railway. In 1898 he became general superintendent of the Omaha & St. Louis and the Omaha, Kansas City & Eastern lines, but resigned the next year to report on various railroads for Eastern capitalists. From 1900 to 1902 he was manager of the Kentucky & Indiana Bridge & Railway Company, Louisville. During 1902 and 1903 he was general manager of the Hudson Valley Railway, Glens Falls, N. Y. From 1903 to 1906 he was general manager of the Union Terminal Railway, Sioux City, Ia., and during 1906-1907 he was vice-president and general manager of the Maryland Telephone & Telegraph Company and the Baltimore Electric Power Company.

Mr. Howard L. Reichart was on April 2, 1913, appointed assistant secretary of the New York State Railways and the Rochester Railway & Light Company, with headquarters in Grand Central Terminal, New York, N. Y.



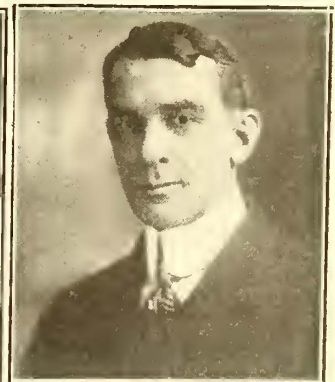
H. L. Reichart

Mr. Reichart was born in Troy, N. Y., and has been connected with the electric railway and lighting business since May 1, 1906, at which time he entered the employ of the companies named, serving in the capacity of chief clerk of the New York office. Prior to this time, during 1903 and 1904, he was with the Central New York Car Service Association at Albany, N. Y., resigning this employment on Dec. 1, 1904, to accept a position in the office of the secretary of the New York Central & Hudson River Railroad, New York City.

Mr. J. C. Collins was on April 2, 1913, appointed general auditor of the New York State Railways, the Mohawk Valley Company and the Rochester Railway & Light Company in addition to being secretary of the New York State Railways and the Rochester Railway & Light Company. Mr. Collins has always been in the accounting field and has been connected with the New York State Railways and its subsidiaries for the last ten years. He also served as secretary of the Street Railway Association of the State of New York, the predecessor of the New York Electric Railway Association, and is an active member of the American Electric Railway Accountants' Association, serving for two years as co-chairman of the committee, on freight and express accounting and being now a member of the joint committee on engineering accounting. The New York State Railways owns and operates street and interurban electric railways in Rochester, Syracuse, Utica and vicinity and owns a half interest in the Schenectady Railway, which operates the electric railways in Schenectady and the interurban electric railways between Schenectady, Albany, Troy and Saratoga. The Rochester Railway & Light Company owns and operates all the electric light, power and gas



F. B. Lasher



J. C. Collins

plants in Rochester and vicinity. The New York State Railways operates about 340 miles of electric railway. Mr. Collins succeeds Mr. R. A. White as general auditor of the companies previously mentioned, Mr. White having resigned to devote all his time to the New York Central & Hudson River Railroad. The position of assistant general auditor, from which Mr. A. L. Linn, Jr., has resigned, as noted in the *ELECTRIC RAILWAY JOURNAL* of March 29, 1913, has been abolished in the new scheme of organization of the accounting forces of the companies.

Mr. H. C. Eddy, who was recently appointed engineer of the Public Utilities Commission of the District of Columbia, was born in Morristown, N. J., on Aug. 13, 1870. Mr. Eddy attended Lehigh University and later took a special course

in electricity at Columbia University, New York City. On the completion of this course in 1892, he entered the employ of the New Jersey Traction Company at Newark, N. J., in connection with power station operation, and was later employed in a similar capacity by the Newark & South Orange Railway. After spending several years in electric railway work and in lighting construction, inspection and operation in various localities, Mr. Eddy was appointed assistant superintendent and electrical engineer on the staff of J. G. White & Company, in connection with the contract for installing a complete and extensive street railway system in the city of Auckland, New Zealand. Returning from New Zealand on the completion of the work, Mr. Eddy was employed for a time on the engineering staff of the Boston & Northern Street Railway and was later employed by J. G. White & Company as superintendent of overhead construction on the installation of the Rochester, Syracuse & Eastern Railway. Some time later he was employed as superintendent of underground construction for the Potomac Electric Power Company, Washington, D. C., which position he resigned to become assistant electrical engineer for the District of Columbia. In 1908, when Congress passed the act giving the Interstate Commerce Commission jurisdiction over the electric railways of the District of Columbia, Mr. Eddy was selected as executive officer in charge of this jurisdiction for the commission, which position he retained until March 11, 1913, when he was appointed engineer to the Public Utilities Commission of the District of Columbia, created by act of Congress approved on March 4, 1913. By the terms of this act the jurisdiction over the local street railways, formerly given to the Interstate Commerce Commission, was transferred to the District Commissioners.

OBITUARY

James McCrea, formerly president of the Pennsylvania Railroad, died at his home in Philadelphia, Pa., on March 28, 1913. McCrea retired as president on Nov. 13. He had been in the service of the company forty-eight years.

George B. Kerper, who was well known in electric railway circles in Ohio, is dead. Mr. Kerper was president of the Mount Adams & Eden Park Inclined Plane Railway, Cincinnati, and was one of the promoters of the Toledo, Bowling Green & Southern Traction Company. Mr. Kerper was an associate of the late Charles Kilgour and was connected with electric railway developments in and about Cincinnati. He was a native of Reading, Pa.

C. Edgar Titzel, manager of the Lancaster County Railway & Light Company, Lancaster, Pa., which controls through stock ownership the Conestoga Traction Company, Edison Electric Company and Lancaster Gas Light & Fuel Company, died early on Sunday, March 30, 1913, following a cerebral hemorrhage. Mr. Titzel was born at Irwin on May 4, 1875. He was a son of the late Rev. John M. Titzel. He entered the employ of the Edison Electric Illuminating Company, Lancaster, as a clerk when he was fifteen years old and was promoted through the various departments of the company and finally made manager of the controlled companies and the holding company, the Lancaster County Railway & Light Company. He was a member of the American Electric Railway Association, the National Electric Light Association and the American Gas Institute. Mr. Titzel is survived by a widow and two daughters.

James Bricker, superintendent of transportation of the Philadelphia (Pa.) Rapid Transit Company, whose death on March 20, 1913, was noted briefly in the *ELECTRIC RAILWAY JOURNAL* of March 22, 1913, had been connected with the street railways in Philadelphia for thirty-five years. He was born in Cumberland County, Pa., on Dec. 1, 1843. He served during the latter part of the War of the Rebellion and was honorably discharged at its close. He then entered business in Harrisburg and subsequently went to Philadelphia. Mr. Bricker became a conductor with the West Philadelphia Railway during horse car days and rose gradually to be superintendent of the Union, Electric and People's Traction Companies and eventually became general superintendent of the Union Traction Company. He was subsequently appointed superintendent of transportation of the company and held that position at the time the company was taken over by the Philadelphia Rapid Transit Company.

Construction News

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

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

RECENT INCORPORATIONS

***St. John (N. B.) Suburban Railway.**—Chartered in New Brunswick to build electric lines in the suburbs of St. John. Incorporators: James Ross, president; John R. Graham, president of the Bangor Railway & Electric Company, and Henry W. Cushman, president of the Merrill Trust Company, St. John.

***Beaufort (N. C.) Terminal Railway.**—Incorporated in North Carolina to build a 12-mile interurban railway between Beaufort and Cape Lookout and to construct terminals there. Incorporators: E. C. Duncan, a director of the Norfolk Southern Railroad, and F. L. Nicholson, Norfolk.

***Oakland, Geistown & Arbutus Park Railway, Geistown, Pa.**—Application for a charter will be made by this company to build an electric railway between Oakland, Geistown and Arbutus Park. Incorporators: William H. Sunshine, O. P. Thomas and Albert Stenger.

***Schuylkill County Railway, Harrisburg, Pa.**—Application for a charter has been made in Pennsylvania by this company to build an electric railway in Schuylkill County. It is proposed to extend the lines to Frackville, where connection will be made with the lines of the Pottsville Traction Company, thus completing the line between Sunbury and Philadelphia.

***Shenandoah & Wiggins Railway, Harrisburg, Pa.**—Application for a charter has been made by this company in Pennsylvania, as a subsidiary company of the Schuylkill Railway, to build an electric railway in Schuylkill County. It is said that Philadelphia capitalists are behind the project.

***Reading Transit & Light Company, Reading, Pa.**—Chartered in Pennsylvania with a capital stock of \$4,500,000. This is the new lessee of the Reading group of the Interstate Railway properties and is part of the plan of the Eastern Power & Light Corporation to take over a number of electric railway and light properties, including the Reading Transit Company, the United Traction Company, Reading, Lebanon Valley Street Railway and others, as mentioned in the *ELECTRIC RAILWAY JOURNAL* for March 15, 1913, page 552.

***West Virginia Light & Traction Company, Charleston, W. Va.**—Chartered in West Virginia to operate electric railways and other public utilities. Capital stock, \$500,000. Incorporators: Angus McDonald, O. P. Fitzgerald, V. L. Black, L. G. Summerfield and John Wehrle, all of Charleston, W. Va.

FRANCHISES

Birmingham, Ala.—J. B. Coyle, acting as chairman of a committee of West End citizens, has asked the Council for a franchise for an electric line from Osceola station, Birmingham, on the North Bessemer line, to Berney station, on the South Bessemer line, making a West End loop and connecting Ensley with the former suburb. It is said the Birmingham Railway, Light & Power Company is willing to build this line.

Los Angeles, Cal.—The Los Angeles Railway has asked the Council for a twenty-one-year franchise over Mission Road from Keith to a point easterly of the railway in Los Angeles.

Los Angeles, Cal.—The Pacific Electric Railway has received a franchise from the Council on Avenue Sixty-four to connect with the company's tracks at Pasadena Avenue in Los Angeles.

San José, Cal.—F. E. Chapin, general manager of the electric lines in Santa Clara County for the Southern Pacific Company, has asked the Board of Supervisors for a fifty-year franchise over Alum Rock Avenue from the easterly city limits of San José to the New San José Golf and Country Club, a distance of 5 miles.

San José, Cal.—The San José Terminal Railway has asked the Council for a franchise over Delmas Avenue and also on East Santa Clara Street in San José. Sealed bids will be

received by the city clerk of the Council up to April 21 for the sale of franchise to the highest bidder.

Athens, Ga.—The Athens Railway & Electric Company has asked the Council for a franchise to extend its line to Barberville.

Atlanta, Ga.—The Georgia Railway & Electric Company has asked the County Commissioners for a franchise out the Howell Mill Road to the Collier Road in Atlanta.

Gary, Ind.—The Gary & Interurban Railway has asked the Council for a franchise on four streets in addition to those covered by the present lines in Gary.

Cedar Rapids, Ia.—The Cedar Rapids & Iowa City Railway & Light Company has received a twenty-five-year franchise to build eight extensions and double-track some of its lines in Cedar Rapids.

Clinton, Ia.—The Clinton Street Railway has received a twenty-five-year franchise from the Council in Clinton.

Henderson, Ky.—The Southwestern Electric Railway, Light & Power Company will ask the Henderson County Fiscal Court for a franchise through Henderson County to Henderson, Marion, Smithland and other points in Henderson County.

Winchester, Ky.—The Clark County Fiscal Court, of Winchester, Ky., has sold to the Kentucky Utilities Company, Lexington, a franchise for the construction of an electric railway line as well as electric light and power lines in that county. It is said that the company will begin the construction of an interurban railway embracing Winchester, Mount Sterling and other Eastern Kentucky towns in the near future.

Abbeville, La.—The Southwestern Traction & Power Company has asked the Council for a franchise over certain streets in Abbeville.

Pittsfield, Mass.—The Berkshire Street Railway has asked the Council for a franchise to extend its line from the present terminus of the Elm Street line in Pittsfield easterly to the junction of Elm Street with the Dalton division road, thence northerly on the Dalton division road along East Street to the company's tracks at the Junction.

Minneapolis, Minn.—The City Council has been asked to grant a franchise for a cross-town line in North and Northeast Minneapolis by the special committee on railway extensions in Minneapolis.

Elizabeth, N. J.—The Public Service Railway, Newark, has received a franchise from the Council to operate the Short Line through Elizabeth.

Trenton, N. J.—The New Jersey & Pennsylvania Traction Company has asked the Council for a franchise to build a double-track line from the Calhoun Street bridge to the feeder on Calhoun Street in Trenton.

Rome, N. Y.—The New York State Railways has received franchises from the Common Council in East Dominick Street and West Dominick Street in Rome.

Yonkers, N. Y.—The Yonkers Railroad has asked the Mayor for permission to double-track, construct additional turnouts and extend some of its lines in Yonkers.

Cleveland, Ohio.—The Cleveland Railway has accepted an ordinance giving it authority to extend its Union Street line from East Ninety-third Street to East 116th Street in Cleveland.

Brantford, Ont.—The Lake Erie & Northern Railway will ask the Dominion Railway Board, which will hold a session in Brantford April 7, for a route between Brantford and Galt.

El Paso, Tex.—The El Paso Electric Railway has asked the Council for a franchise from the Fort Bliss line on Boulevard to Manhattan Heights. The company will build another extension up North Oregon Street and over the mesa and one along Tenth Street to the El Paso Milling Company's plant in El Paso.

Richmond, Va.—The Richmond & Henrico Railway has received two franchises from the Council for extensions of its Fulton Hill and Thirty-fifth Street lines and extensive trackage rights in the West End of Richmond.

Richmond, Va.—The Virginia Railway & Power Company has received a franchise from the Council for a line west on Broad Street from the Boulevard to the corporate limits of Richmond.

TRACK AND ROADWAY

San Francisco-Oakland Terminal Railways, Oakland, Cal.—About 9.4 miles of double track will be built by this company during the year.

Geary Street Municipal Railway, San Francisco, Cal.—The Board of Works has approved the plans and specifications for the construction of the western extension of this line in San Francisco from Thirty-third Avenue to the ocean beach and has requested the Supervisors to set aside \$57,400 to bear the expense of the construction.

Stockton Terminal & Eastern Railroad, Stockton, Cal.—This company plans to build an 11-mile line between Ballota and Jenny Lind during the year.

Denver (Col.) City Tramway.—A 2-mile extension of the Sixth Avenue line eastward from the present terminus at Madison Street, with other extensions and construction work in different parts of Denver, is an improvement proposed for the summer by this company.

Rome Railway & Light Company, Rome, Ga.—This company will build 2 miles of new track in Rome this year.

Caldwell (Idaho) Traction Company.—Plans are being made by this company for an extension around the south side of Deer Flat reservoir in Caldwell.

Quincy (Ill.) Railway.—About 2 miles of new track will be built in Quincy by this company during the year.

Union Traction Company of Indiana, Anderson, Ind.—An 18-mile line between Muncie and Newcastle will be built by this company during the year.

Oskaloosa Traction & Light Company, Oskaloosa, Ia.—This company plans to build about 1 mile of new track during 1913.

***Topeka-Kansas City Interurban Railway, Topeka, Kan.**—Plans are being considered to build an electric railway between Lawrence, Kansas City and Topeka this spring. Among those interested are F. H. Thomas and R. E. Townsend, Topeka.

Louisville (Ky.) Railway.—Extensions of importance are being considered by this company. Upon the urgent suggestion of residents of the western section of Louisville the company is considering the extension of either its Walnut or Jefferson Street lines to Shawnee Park.

New Orleans & Western Railway, Gretna, La.—Plans have been completed by this company for an extension from Amesville to Westwego. The company also plans to build a belt line around the new Harvey and Marrero additions in New Orleans. C. D. Warren, Gretna, president. [E. R. J., Nov. 9, '12.]

Portland, Gray & Lewiston Railroad, Portland, Me.—A 10-mile line between Lewiston and Portland will be built during 1913 by this company.

Electric Short Line Railway, Minneapolis, Minn.—This company, which is now constructing its line from Minneapolis to Winsted, Minn., is considering a proposition made by men identified with the Commercial Club of Watertown, S. D., to construct, independently and at this time, a line from Watertown to Lake Kampeska, to be a part of the system when the line shall have reached South Dakota on continued construction from Minneapolis.

Laurel Light & Railway Company, Ellisville, Miss.—Grading has been begun by this company on its line between Laurel and Ellisville. M. H. Thomasson has the contract for grading, and it is understood that the Hewes Contracting Company will construct the line. [E. R. J., Feb. 1, '13.]

Hattiesburg (Miss.) Traction Company.—Among the improvements planned by this company during the year will be the extension of the Mobile Street line along Seventh Street to Boule Street. The company has ordered for installation sufficient 70-lb rails to take the place of the light rails on Hardy Street.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—This company plans to build about 2 miles of new track during 1913.

Public Service Railway, Newark, N. J.—A petition will be presented shortly to this company by a committee from the borough councils of Cresskill, Demarest and Closter for a 4-mile extension from Tenafly to Closter.

Elmira Water, Light & Railway Company, Elmira, N. Y.—This company expects to build about 4 miles of new track in Elmira and about 1 mile in Watkins and Millport on the Glen Route.

North Carolina Traction Company, Danbury, N. C.—It is reported that this company plans to construct soon an electric line from Rutherfordton to Asheville, via Chimney Rock, to cross there on a bridge 100 ft. high. Thence it will extend up Reedy Catch Creek to a point near Slick Rock Inn; thence it loops and gradually climbs alongside and around Bear Wallow Mountain, at an elevation of 250 ft. above the valley, going on the Hickory Nut gap. Directly from there it goes to Fairview, then to Biltmore, passing near St. Genevieve's College to the Cox estate building, with a terminal station in front of the Southern Express office in Biltmore.

Grand Forks (N. D.) Street Railway.—Among the improvements planned by this company during the year will be the relaying of the line between Grand Forks and the University and an extension into East Grand Forks.

Pittsburgh & Cincinnati Traction Company, Cincinnati, Ohio.—The survey for this line between Cincinnati, Ohio, and Pittsburgh, Pa., has been made as far as Ironton. The company has secured an extension of one year on its franchise in Portsmouth, Ohio, and is considering plans to build a Pittsburgh terminal. H. A. Kirshner, Pittsburgh, is interested. [E. R. J., March 16, '12.]

Lake Shore & Michigan Southern Railroad, Cleveland, Ohio.—Plans are being made by this company to build a gasoline line between Cleveland and Conneaut.

Oklahoma (Okla.) Railway.—Plans are being made by this company to build an extension from Moore to Norman.

Sand Springs (Okla.) Railway.—This company plans to build 10 miles of new track during the year.

Toronto & Eastern Railway, Toronto, Ont.—This company has secured a location for a line through Pickering. The contracts have been let for the building of that section of the line between Pickering and West Hill.

***Toronto, Ont.**—A deputation from the Associated Boards of Trade presented to the Ontario government the resolution determined upon by the Associated Boards at their annual meeting in London on Feb. 27 and 28, 1913. Five of the resolutions deal with the question of railway development, particularly in northern Ontario. The extension of the provincial railway northward to James Bay and south to Toronto is recommended, and in connection therewith the establishment of a complete system of electric radial railways east and west.

***Grant's Pass, Ore.**—A \$200,000 bond issued to be used in building an electric line from Grant's Pass to Crescent City, via the Illinois Valley, was recently sold. The line will be municipally owned and operated. Nearly all the right-of-way has been secured and twenty-six acres of terminal ground has been purchased.

Portland, Eugene & Eastern Railway, Portland, Ore.—The Southern Pacific Railroad's steam line on Fourth Street, a unit of the Portland, Eugene & Eastern Electric Railway, will be converted into an electric line. Material has been ordered and work will be started within a month.

Portland Railway, Light & Power Company, Portland, Ore.—Plans are being made by this company to begin work at once on its new East Harrison Street line in Portland. The proposed line would run on East Thirty-ninth Street from Sellwood past the Reed College and thence north to the Columbia Boulevard, connecting all the east and west lines of the company.

Duquesne & Dravosburg Street Railway, Duquesne, Pa.—This company will build about half a mile of new track during 1913.

Northwestern Railways Company, Meadville, Pa.—During the year this company will build 3½ miles of new track between Venango and Cambridge.

Philadelphia (Pa.) Rapid Transit Company.—This company has been asked to consider plans to build a 1½-mile extension of its lines on Torresdale Avenue from Cottman Street to Blakiston Street in Philadelphia.

Pottstown & Reading Street Railway, Pottstown, Pa.—

Contracts will soon be awarded by this company for excavating its line from the Power Pottsgrove township line to Linfield. The ties, tracks and overhead work will be laid by the company. Bids will soon be asked by the company to build the bridge which will span the Schuylkill River at Linfield. This extension will be built to Spring City.

Philadelphia & Western Railway, Upper Darby, Pa.—Surveys have been begun by this company for the extension from Valley Forge to Bridgeport. An order has been placed with the Pennsylvania Steel Company for 750 tons of 70-lb. steel rails and a contract for 15,000 cross ties has been placed with Bush & Company, Wilmington. The Phoenix Bridge Company has the contract for a bridge over Valley Creek, and Daniel E. O'Connell & Company, Avondale, will build the concrete piers and abutments. The company has purchased 8 acres adjoining the park at Valley Forge.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.—During 1913 this company plans to build 1 mile of new track between Highfield, Md., and Blue Ridge Summit, Pa.

Montreal (Que.) Tramway Company.—This company has under consideration an elaborate program for the improvements of its lines in Montreal, which includes an expenditure of \$10,000,000.

***Battleford, Sask.**—A project to build an electric railway to connect Battleford and North Battleford, Sask., has been submitted to the people of these two towns. F. P. Alywin, Ottawa, is the representative of the syndicate making the proposal, and the proposition he submitted is on the lines of the contract made between the Moose Jaw Electric Railway and the city of Moose Jaw. Mr. Alywin stated that the capital is ready to build the line as soon as an agreement is entered into.

Knoxville Railway & Light Company, Knoxville, Tenn.—During 1913 this company plans to build 4 miles of new track from Knoxville to Bearden.

Memphis (Tenn.) Street Railway.—This company plans to build 5 miles of new track during 1913.

Murfreesboro (Tenn.) Electric Railway.—Work will soon be begun by this company on its line between Nashville, Woodbury and Murfreesboro. J. L. Parkes, Murfreesboro, local representative. [E. R. J., Jan. 11, '13.]

Jefferson County Traction Company, Beaumont, Tex.—Contracts have been awarded by the Stone & Webster Engineering Corporation, which is building this line, for the grading, fencing, culverts and bridges for the interurban line between Beaumont and Port Arthur. [E. R. J., March 29, '13.]

Bryan & College Interurban Railway, Bryan, Tex.—Surveys have been made by this company on its 35-mile line between Bryan and Stone City.

Southern Traction Company, Dallas, Tex.—Tracks are being laid by this company on its line between Waco, Elm Mott and Dallas.

Texas Traction Company, Dallas, Tex.—Work has been begun by this company on its extension from Dallas to Corsicana.

Blue Ridge Interurban Railway, Greenville, Tex.—About 12 miles of track has been laid by this company on its line between Anna, Blue Ridge and Greenville. A. R. Nicholson, Greenville, is interested. [E. R. J., Oct. 12, '13.]

Longview Junction Street Railway, Longview, Tex.—During 1913 this company plans to build 1½ miles of new track.

San Antonio & Austin Interurban Railway, San Antonio, Tex.—Surveys are being made by this company from Austin to Lockport and Seguin and from New Braunfels to San Antonio. Power is to be furnished by three dams across the Guadalupe River. The county has granted permission for the use of bridges for crossing the streams, and the city has granted franchises for the use of such streets as are necessary. Vories B. Brown, San Antonio, president. [E. R. J., March 8, '13.]

Charlottesville & Albemarle Railway, Charlottesville, Va.—During 1913 this company will build 2 miles of new track.

Grafton (W. Va.) Traction Company.—This company plans to build a line to Pruntyville in the near future.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Work has been begun by this company rebuilding, raising the grades and repaving some of its lines.

***Milwaukee (Wis.) Traction Company.**—Plans are being made to incorporate this company to build an electric line from the end of the railway at Green Bay Avenue and Keefe Avenue in Milwaukee to a point 2½ miles north. This line will furnish transportation facilities to Evergreen Park and vicinity and will be owned and controlled by citizens of Milwaukee exclusively. Among those interested is Lorenz Wagner, Milwaukee.

SHOPS AND BUILDINGS

British Columbia Electric Railway, Vancouver, B. C.—Plans are being made by this company to build an addition to its repair shop and carhouses in Burnaby, in addition to the repair shops which the company has at New Westminster. This company has called for bids for the construction of a building for the use of employees stationed in Vancouver. The building will be at the corner of Main and Prior Streets and directly opposite the principal carhouse in Vancouver and the repair shops maintained at that point. The structure will be 25 ft. x 60 ft. and five stories in height. The type of construction will be of reinforced concrete with facings of brick and artificial stone.

Northern Electric Railway, Chico, Cal.—It is reported that after July 1 this company will begin the construction of a new passenger and freight depot at the corner of Second Street and E Street in Marysville.

Springfield (Mass.) Street Railway.—This company, which has plans drawn for a new carhouse for the Hadley lot in Ward 1, Springfield, will have to secure a new location as the city plans to use this property for a park.

Hattiesburg (Miss.) Traction Company.—This company will soon build an office building on West Pine Street in Hattiesburg. The company will also build an addition to its carhouse to include woodworking shops and blacksmith shops, wheel press and a complete plant for repairing its cars.

Grand Forks (N. D.) Street Railway.—This company plans to build soon a new carhouse in Grand Forks.

Oklahoma Public Service & Interurban Lines, Stillwater, Okla.—Plans are being made by this company to build new repair shops in Stillwater.

Portland Railway, Light & Power Company, Portland, Ore.—Plans have been prepared by this company to build a one-story reinforced concrete station at Thirteenth Street and Ochoco Avenue in Portland. The cost is estimated to be about \$4,000.

Washington-Oregon Corporation, Vancouver, Wash.—This company has completed an office and depot at Third Street and Columbia Street in Vancouver and has removed the traffic department offices there.

POWER HOUSES AND SUBSTATIONS

Glendale & Eagle Rock Railway, Los Angeles, Cal.—A new substation is being built by this company in Montrose.

Hattiesburg (Miss.) Traction Company.—This company's motive power will be more than doubled by the installation of an 1800-hp turbine with condenser and cooling tower. Additional switchboard facilities will be provided and a 200-kw generator will be added to the equipment.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—This company plans to build a power house in Elmira in the near future.

Toledo Railway & Light Company, Toledo, Ohio.—This company has placed an order with the General Electric Company for a 12,500-kw turbo-generator to be installed in its power plant on Water Street, Toledo.

Oklahoma Public Service & Interurban Lines, Stillwater, Okla.—Plans are being made by this company to build a power house in Stillwater.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for a 1000-kva water-cooled transformer for the Tacoma substation and for two 1000-kva air-blast transformers for its substation in Seattle.

Manufactures and Supplies

ROLLING STOCK

York (Pa.) Railway is reported to be in the market for two cars.

Cleveland (Ohio) Railway has ordered 100 trail cars with trucks from the G. C. Kuhlman Car Company.

International Railway, Buffalo, N. Y., has ordered 100 near-side cars from the G. C. Kuhlman Company.

Portland, Gray & Lewiston Railroad, Lewiston, Maine, has ordered one flat-car body from the Wason Manufacturing Company.

Northampton (Mass.) Street Railway has ordered two fourteen-bench open car bodies from the Wason Manufacturing Company.

Toledo Railway & Light Company, Toledo, Ohio, is in the market for twenty center-entrance trail cars similar to those now in use in Cleveland.

Virginia Railway & Power Company, Richmond, Va., has ordered twenty cars from the Cincinnati Car Company. They will be equipped with Brill 51-E-1 trucks.

Sioux Falls (S. D.) Traction System has ordered from the St. Louis Car Company one 26-ft. 6-in. car body with T-post construction, mounted on a 12-ft. Warner truck.

Boston (Mass.) Elevated Railway will call soon for bids upon the construction of thirty articulated cars similar to that described in the ELECTRIC RAILWAY JOURNAL for March 29, page 583.

Philadelphia (Pa.) Rapid Transit Company has ordered 600 additional near-side cars from The J. G. Brill Company and fifty additional elevated and subway cars from the Pressed Steel Car Company.

Chicago (Ill.) Railways will be in the market in the near future for from 100 to 150 new cars, either to purchase outright or buy the material and manufacture them in its own shops. No definite decision has been reached as to the details of the design.

Tidewater Southern Railway, Stockton, Cal., has specified the following details for the four combination passenger, baggage and smoking cars which are being built by the Jewett Car Company.

Seating capacity.....	50	Roof	arch
Weight (car body only),		Underframe	composite
	35,000 lb.	Couplers	radiating MCB
Length over vestibule,		Curtain fixtures..	Cur. S. Co.
	50 ft. 0 in.	Curtain material..	Pantasote
Length over all... ..	51 ft. 0 in.	Motors	inside-hung
Width over sills....	9 ft. 3 in.	Sanders	Jewett
Body	wood	Seats	H & K
Interior trim.....	mahogany	Seating material....	rattan
Headlining	Agasote	Trucks	MCB

TRADE NOTES

Day & Zimmerman, Philadelphia, Pa., have opened new engineering offices at 611 Chestnut Street, Philadelphia.

D. C. & Wm. B. Jackson, Boston, Mass., engineers, have moved their Boston office from 84 State Street to 248 Boylston Street.

Page & Hill Company, Minneapolis, Minn., has moved its general offices from the Lumber Exchange to 812-814 Plymouth Building, Minneapolis.

Track Necessities Company, Chicago, Ill., has been incorporated with a capital stock of \$5,000 to manufacture and deal in railway supplies. The incorporators are: L. C. Hurley, H. A. Fischer and Richard Y. Hoffman.

Electric Products Company, Cleveland, Ohio, manufacturer of Wotton automatic battery-charging panels, has moved into its new building at 10514 Dupont Avenue, Cleveland. During the past year the company has shown 227 per cent increase in sales.

Electric Storage Battery Company, Philadelphia, Pa., reports its total net income for the year ended Dec. 31, 1912, as \$1,125,279. The dividends on the common and the preferred stock amounted to \$649,964. The surplus for the year was \$475,315.

J. W. Paxson Company, Philadelphia, Pa., has introduced a novel method of displaying its products to its patrons. This is done by means of a small electric stereopticon machine which is carried by the salesman. It can be attached to any electric lamp socket and thus the salesman can show the complete line of foundry facings, supplies and equipment manufactured by the company.

Pressed Steel Car Company, Pittsburgh, Pa., announces the following appointments, effective April 1, 1913: Charles A. Lindstrom, formerly chief engineer, has been appointed assistant to the president, with headquarters in the Farmers' Bank Building, Pittsburgh. B. D. Lockwood, formerly assistant chief engineer, has been appointed chief engineer. J. F. Streib, formerly mechanical engineer, has been appointed assistant chief engineer. Felix Koch has been appointed mechanical engineer.

N. W. Halsey & Company, New York, N. Y., announce that after March 31, 1913, their business in the New England States will be handled by Halsey & Company, Inc., 55 Congress Street, Boston, Mass. Halsey & Company, Inc., will act as fiscal agents for municipalities, corporations and estates and will deal in government, municipal, railroad and public utility bonds, with special reference to the requirements of the New England market. F. Monroe and George A. Lyon, Jr., will be in charge.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received the following orders for railway motors: Shreveport (La.) Traction Company, three quadruple equipments of No. 306 motors and K-36-J control; Michigan Railway Engineering Company, Jackson, Mich., six quadruple equipments of No. 333-B-2 motors and HLF control; Lehigh Valley Transit Company, Allentown, Pa., two quadruple equipments of No. 303-A motors and type AL control; Detroit (Mich.) United Railway, one quadruple equipment of No. 303-B-2 motors and US control.

Western Electric Company, New York, N. Y., reports gross sales for the year ended Dec. 31, 1912, as \$71,727,329. This compares with \$66,211,795 in the preceding year. The surplus after deduction of manufacturing costs and other expenses was \$4,853,265, which compared with \$3,280,292 in 1911, and is equivalent to 32.36 per cent on the \$15,000,000 capital stock, against 21.87 per cent in the previous year. The surplus for the year was \$1,067,410, as compared with \$890,292 for the year ended Dec. 31, 1911. The company has received an order from the Western Maryland Railroad for telephone train-dispatching equipment to be installed over a circuit extending from Hagerstown to Cumberland, a distance of 80 miles. The apparatus to be used is the No. 102 type selector set containing the No. 50 selector.

Hale & Kilburn Company, Philadelphia, Pa., has issued its annual report for the year ended Dec. 31, 1912. After payment of dividends at the rate of 7 per cent on the first and second preferred stocks and 4 per cent on the common stock, aggregating \$460,538, the balance of profits added to surplus account amounted to \$125,411. Manufacturing operations during the year have been hindered owing to difficulties incident to construction of an addition to the plant. This addition consists of a five-story steel and concrete building now nearing completion. On Dec. 31, 1912, unfilled orders amounted to \$3,720,040, as compared with \$820,211 on Dec. 31, 1911. In addition to the capital expenditure for extension to manufacturing plant, the company purchased real estate worth \$55,000 necessary to complete its holdings on Sixth Street, Philadelphia.

C. P. Howard and Shelby S. Roberts, formerly connected with the engineering department of the Illinois Central Railroad, have opened an office in the Transportation Building, Chicago, Ill., for the general practice of civil engineering, specializing in both steam and electric railway and yard and terminal surveys, location, plans, estimates, valuations and studies of economies of operation. Mr. Howard was formerly assistant chief engineer of the Deepwater Railroad and chief engineer of the Tidewater Railroad. Recently he has been engaged in location and special investigation for the Lake Shore and the Illinois Central Railroads. Mr. Roberts was division engineer of construction of the Illinois Central Railroad, designing and supervising construction of the Centralia gravity yards and those at Champaign.

ADVERTISING LITERATURE

Western Electric Company, New York, N. Y., has issued special Bulletin No. 54.20, in which the many types of Hill knife switches are listed and illustrated.

Industrial Works, Bay City, Mich., have issued Bulletin No. 209, in which their various types of wrecking, locomotive, construction and freight cranes are illustrated.

Cleveland Fare Box Company, Cleveland, Ohio, has issued a booklet which describes its various types of fare boxes. Several illustrations are shown of cars which are equipped with Cleveland fare boxes.

W. N. Matthews & Brother, St. Louis, Mo., have issued two circulars in which Matthews fuse switches are briefly described and illustrated. Another circular issued by the company is devoted to Matthews guy anchors.

Reliance Electric & Engineering Company, Cleveland, Ohio, has issued Bulletin No. 1010, which describes the advantages and characteristics of the Reliance adjustable speed motor of the armature-shifting design. The bulletin also contains illustrations showing the various forms of speed control of this type of motor.

Stone & Webster, Boston, Mass., have issued a booklet of information for the year 1913, covering the companies under their management. The publication is a model of its kind. A statement of the combined earnings for the year ended Dec. 31, 1912, of the companies under the management of Stone & Webster was published in the *ELECTRIC RAILWAY JOURNAL* of March 1, 1913, page 394.

ChicagoPneumatic Tool Company, Chicago, Ill.**, has issued Bulletin E-28, which briefly describes and illustrates its line of Duntley track drills, heavy-duty side-spindle drills, heavy-duty center-spindle drills, portable electric grinders and electric spike drivers. Circular No. 143 issued by the company describes and illustrates its electric signal bonding outfit and Circular No. 145 gives a description of the triple-ignition Rockford motor car built by the company.

Delos F. Wilcox, chief of the bureau of franchises of the Public Service Commission of the First District of New York, addressed the City Club of Cleveland recently. Mr. Wilcox is reported to have said in part:

"I believe in ultimate public ownership of all important public utilities. We recognize that the operation of a public utility is a public function. If public utilities in their nature are public the country must decide that either stringent public regulation or public ownership is necessary. Regulation is an additional cost of operation. To make regulation effective you need as capable men as would be needed to operate the utility. The only argument left against public ownership is in the fear that graft makes it best to leave operation of utilities to private enterprise. The answer to this is that no one says that we should turn the police force over to operation by a detective agency, or the fire department to the insurance companies, or abandon public education. The argument that the city is unfit to manage public utilities includes the assumption that city government is growing worse, and that we are going to destruction. No one asserts that. Control such as the city of Cleveland exercises over the street railway company must be continuous, and intimate to be effective.

"In controlling public utilities in many states and cities existing laws which have their basis in charters make it impossible to begin as if the problem were new. For this reason Cleveland, now writing its own charter, is in a fortunate position. One of the principles which should be kept in mind is that capital honestly invested should be adequately protected. Another is the necessity from the public viewpoint of making extensions of a service easy. In ownership or control of a public utility it is a poor policy for a city to make money out a public utility for the benefit of taxpayers at large. Money earned should be put into reduction of rates and improvement of service. My view is that improved service should come before reduction in rates. It is a mistake to cut fares or rates excessively at the expense of service. It is of the utmost importance to the city that it should have a department of public utilities to see that franchise obligations are respected and in all ways to maintain an intimate control over public utilities."