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NEW YORK, SATURDAY, OCTOBER 22, 1910.

CONTENTS.

The Engineer as a Citizen

The meeting held at the United Engineering Societies Building on Monday, at which engineers were invited to discuss the engineering and transportation features of the proposed tri-borough subway in New York, was a step in the right direction. Engineers and transportation men, as citizens, have as much interest in public matters as any class of persons in the community, and when the questions are of an engineering or transportation character they are often more interested than other citizens in seeing that the proper plan is followed. As they are better fitted to understand these problems than their neighbors there is every reason why they should express their opinions. In fact, it is a duty which they owe the public. We trust that the meeting, which was held under the auspices of the American Institute of Electrical Engineers on Monday, will be but the first of many which will be held not only in New York, but in every other locality whenever municipal undertakings of an engineering character are being considered.

Proportions of Long Platform Cars

A prominent car builder, in discussing possible methods of reducing car weights at one of the meetings of the Engineering Association last week, suggested that closer attention should be paid to the relation between platform overhang and truck-center distance. The underframe of a car may be considered as a continuous beam supported at two points over the trucks. For minimum deflection the summation of the moments of loading between and outside of the bolsters should be equal. If this condition does not exist, either the body framing or the platform framing must be made stronger and heavier than otherwise would be necessary. The concentration of apparatus hung under the car body as near to the bolsters as the clearances of the trucks will permit also relieves the framing of vertical bending stresses and allows lighter construction to be used. Single-motor trucks with the pony wheels placed under the platforms afford an opportunity for lengthening the distance between bolsters and bringing the electrical and air-brake equipment hung under the car nearer to the points of support.

Service at Railroad Stations

There remains an opportunity in not a few cities for the improvement of street railway service in connection with traffic to and from steam railroad stations. Many companies seem tacitly to assume that those who arrive by train and who would naturally patronize the local trolley system are bound to do so without special appeals, but in view of the acute competition among cabmen it is evident that additional efforts to reach the stranger at the railroad station are needed. The question to be solved is how best to tell him what car he must take and what changes, if any, he must make to reach his

destination. Many strangers who arrive in a city overrate the trouble of securing this information, and either walk or engage a carriage at from ten to twenty times the cost of a car fare. The posting of a map of the company's lines at several points in the station would be of assistance in this connection. The distribution of timetables and the erection of suitable signs might also be of assistance. If permission cannot be secured to use the steam properties for this purpose, illuminated signs outside the station would undoubtedly help in many cases. A great deal can also be done in connection with the distinct marking of cars. The fact is undeniable that a considerable volume of traffic awaits the work of the publicity department in connection with service between the more important business and residential centers and the railroad stations. At present, through ignorance of facilities, many fares are lost by the local railway company to the hackman and the taxicab operator.

Methods of Carrying the Peak Load

The papers and reports presented at Atlantic City were so numerous and covered such a variety of topics that they will afford food for thought for a long time. The power station engineer will naturally be most interested in the report of the committee on power generation, which was an important one in many particulars, but the point which will strike him most forcibly will probably be Mr. Stott's study of the peak load problem. The peak has been the pet horror of every operating engineer since the beginning of electrical distribution, and methods of carrying it economically have been studied at great length. The five methods of carrying the peak considered are storage batteries, purchased power if available, hydroelectric power if available, gas engines, and the deliberate use of steam turbines adapted to carry the extra load. Considering the peak by itself, the fixed charges as shown by the diagram of the committee are by far the most important item, and it is this fact which in the last resort furnishes the criterion of judging the possible merits of relief. The storage battery calls for no plant capacity, but the report states that for peak use only the fixed charges upon it are too heavy to admit it as an economical solution of the problem. Purchased power, whether hydroelectric or not, usually carries a heavy maximum demand charge which is in effect a fixed charge and again gives a high peak value of cost. The peak power derived from gas engines seems at present to be open to the same objection. The investment per kilowatt is large, and while fuel charges are small the gain does not offset the loss for peak use. The point of view of the committee is that the deliberate installation and operation of steam turbines big enough to carry the peak is the best way out of the difficulty. If low-pressure turbines can be added to a reciprocating plant and the boiler investment can be kept down by adding grate surface or forced draft or both to already existing boilers, the investment cost per kilowatt of extra capacity available for the peak is very greatly reduced. The steam turbine has certainly proved a wonderfully economical and flexible means of obtaining power. It has been through troublous times in the earlier part of its career, has successfully passed difficulties that once seemed threatening, and has now established itself as the standard prime mover for electrical work. It is gratifying to find that its usefulness can be stretched, as it were, to meet the most exacting requirements of peak load in the way that the report indicates.

THE INTERURBAN AT BAY

Several unfortunate accidents which have occurred on interurban roads recently have led to the hasty suggestion that if happenings like these cannot be prevented it is best to discontinue operation of the roads. But the destruction of the properties would benefit no one and would remove an excellent and much desired public service. The real question, then, is not one of retention or abolition, but whether improvements or changes, radical or simple, are required in order to produce conditions that will make travel on interurban systems reasonably safe. A short review of the financial problems confronting interurban roads and the history of their origin may be of assistance in considering the situation.

These lines derive, as a rule, about 90 per cent or 95 per cent of their gross revenue from passenger business. They supply a frequent service at rates which steam railroad authorities contend are unprofitable. For local travel they provide trains every hour or thereabouts to many communities that previously were dependent for connecting transportation facilities upon the one, two or three trains a day furnished by steam railroads. But they also give service between many communities which were previously without any except the vehicle method of connection.

When many of these roads were built far less was known of their real cost of operation than at present, and it was supposed that they could flourish with a basic passenger rate considerably less than that charged by the steam railroads. But the old game of cut rates is one at which two can always play. And the steam railroads, deriving less than a quarter of their operating revenues from passenger business and but a fraction of this from the local business in which there was competition with the electric lines, occupied points of vantage in the struggle. With through passenger traffic untouched, with freight rates undisturbed and just now in a fair way to be advanced, the steam railroads have left to the interurban lines a residue of business whose real profitableness in many cases is open to question. Of course, these considerations do not apply at all, or at least they do not apply with noticeable force, in localities where the density of interurban traffic is so great that gross revenues are sufficiently large to yield with careful management proper returns.

The low rates at which the interurban roads invited traffic had another unfortunate effect. They encouraged bargaining on the part of the municipal, town and village authorities which in some instances led to the incorporation in franchises of rates as low as 1 cent a mile. Discriminatory extorted rates of this nature are in the interest of neither the companies nor the public and under such laws as exist in Massachusetts may be revised.

The point that we make is that the interurban roads have sought a business which was largely ignored or neglected by steam railroads and that, through early mistakes and force of circumstances or public opinion, they have been driven to accept the lowest possible rates for it. Instead of securing good rates for what is really a service of incalculable convenience to the public, and for terminal facilities that are remarkably good in many cities, these roads have appeared to be in the position in certain sections of the country of offering a poor thing and receiving poor pay for it.

When a wreck occurs there is a loud public outcry in favor of

mechanical or other additional precautions. Those who are really concerned with the daily operation of the hazardous interurban systems wonder where the fault lies. Is it with the lack of block signals, with the single-track instead of double-track investment, with the operation of over-frequent units at high speed, with the training and discipline of the men, with the management, with weak rules, or where?

The answer to this question is a vital one, which the railways, with their present and future at stake, ought to find. If greater capital investment or larger operating expenses are required in order to insure greater safety of operation, and the properties, with reasonable capitalization and good management, cannot meet these requirements, their rates ought to be increased. The public is desirous of good service and service cannot be of high standard unless the danger of accident is reduced at every point to the minimum. It is better that the public should pay higher rates in order to secure the right quality of service than that low rates should prevail without that full measure of protection of lives which is the first duty of the company.

The hazards of interurban operation are unusually serious and the responsibilities are correspondingly great; the need of excellence in operation should be considered by each company with a full understanding of the facts.

ACTION ON INTERURBAN RULES

While the discussion on the report of the committee on interurban rules in Atlantic City last week was disappointing and the action taken to refer the revised rules back to the committee for further consideration was not accompanied by definite instructions, the year's work has not been altogether wasted. If it served no other useful purpose, the report presented this year directed attention to the difficulties involved in adapting the American Railway Association standard rules to meet the average conditions of electric interurban railway operation. Those companies which have been in doubt as to the relative merits of the Denver rules and the modified steam rules will now have an opportunity to compare the two codes paragraph by paragraph. The opponents of the steam rules will have something tangible to criticise and those who favor the steam rules will have something to defend. The opinions and arguments on both sides, hitherto vague and indefinite, can be crystallized and made ready for the real test of strength which probably will come sooner or later.

It was better, perhaps, that the association did not put itself on record at this time as approving either code in preference to the other. In fact, we do not believe that the final settlement of matters of this kind, which vitally concern every member of the association, should properly be left to a viva voce vote taken at any meeting. A large enough number of membership companies is not represented, nor can such a vote be considered as indicative of the carefully considered judgment of all of those present.

The association has now two codes before it: the Denver code, which was formally adopted by the association a year ago and is still the standard of the association, and the modified A. R. A. code presented this year. That some changes could well be made in the Denver code is admitted, even by its most ardent partisans. The revision of the interurban rules is one of the most important matters to be undertaken during 1911 by the Transportation & Traffic Association, and the committee in charge of the work during the coming year will be in a better position to obtain results than any other, on account of the work which has already been done. It will be impossible for it to accomplish very much, however, unless it receives more help from the membership at large than its predecessors have had in the past. On the other hand, if the committee begins work promptly and secures from each member company of the association operating interurban cars a carefully considered criticism of the two codes which have been presented to the association, its work will be greatly lightened. Under these circumstances it may easily be possible, by the time of the 1911 convention, for the association to prepare a code for adoption by letter ballot which will answer the needs of the majority of its members.

A RETROGRESSIVE EFFECT

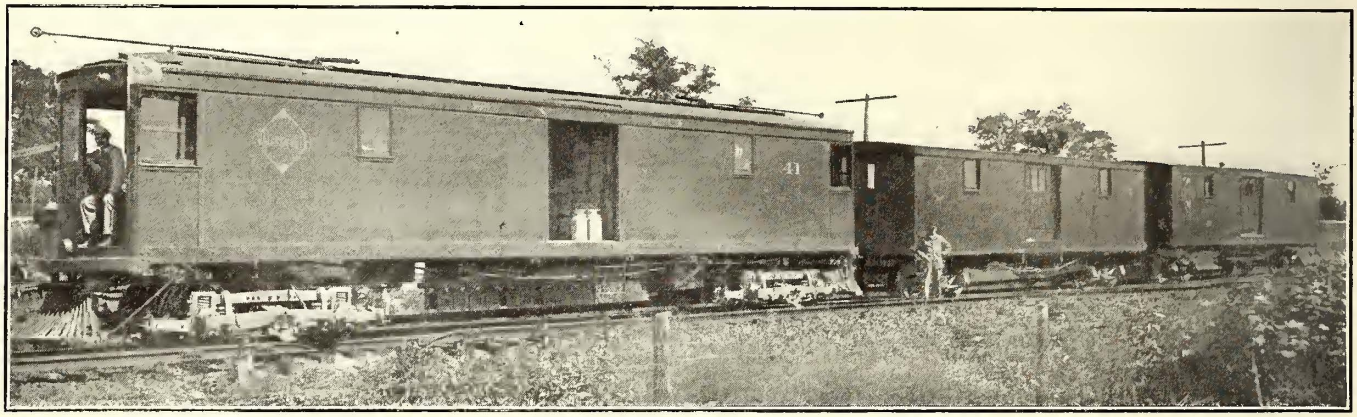
It is a significant and striking commentary upon the retrogressive effect of the new Cleveland ordinance that the gross earnings of the Cleveland Railway appear to have made substantially no increase from 1906 to 1910. The figures given by Mr. Davies in his paper before the Accountants' Association at the Atlantic City convention last week and published in the issue of the Electric Railway Journal for Oct. 15, 1910, page 843, are the authority for this statement. In the six months ended Aug. 31, 1906, passenger earnings amounted to $2,944,934 and gross earnings from operation to $3,011,575. For the corresponding period of 1910 the figures were, respectively, $2,974,460 and $3,065,888. The increase in each case is so small as to be practically negligible. It was 1 per cent in passenger earnings and 1.8 per cent in gross earnings from operation. If we contrast this slender showing with the usual rate of increase expected in properties of this character, the paralyzing effect of the Cleveland developments is seen in clearer light. During a similar period, but counting in full years and starting with 1905 and ending with 1909, a group of ten companies whose earnings were compiled by American Street Railway Investments increased in gross earnings 27.9 per cent. A group of 20 companies whose operations were smaller in amount increased 30.8 per cent in gross earnings.

While the revenues remained stationary in Cleveland more passengers were carried. During the six months of 1906 there were carried 62,334,042 revenue passengers and 24,009,806 transfer passengers, a total of 86,343,848; and in the half year of 1910 the corresponding results were: Revenue passengers, 86,848,832; transfers, 29,108,231; total, 115,957,063. Thus many more passengers had service in 1910, but as the car-mileage failed to keep pace with the increase in traffic it appears that the service was not so plentiful this year as in 1906. That was inevitable under the conditions that were produced. With a developing city the normal rate of increase in population causes a gain in street railway gross earnings and, under ordinary conditions, it is accompanied also by consistent additions to track and equipment.

If, as shown, the Cleveland Railway has been disappointed in its reasonable anticipation of steady increase in gross revenues, we unhesitatingly assert that the same conditions which produced that effect have also prevented the enjoyment by the public of extensions that would have followed, in the natural course of events, the development of the business.

FREIGHT SERVICE OF THE SCIOTO VALLEY TRACTION COMPANY

The Scioto Valley Traction Company established its freight business on Dec. 5, 1905, shortly after the opening of the road for passenger service. When the line was built its projectors had anticipated the development of a freight business, but did not make any such provision for its care as has been found necessary with the increasing appreciation of the value of the service on the part of residents of the district served. Shortly after the inauguration of the freight business J. O. Bradfield was appointed general freight agent. He was experienced in steam railway practice, but had not been connected with any electric railway properties. He has continued to follow largely existing steam railway practice.



Scioto Valley Traction Company—Freight Motor Car with Two Trailers

When the freight service was started general merchandise was handled almost exclusively. An advertisement was placed in the newspapers published in the various cities and towns on the line announcing that the service would be started on the date given. In the ensuing six months business was solicited almost continuously, but it was found then to be unnecessary to solicit merchandise business, as the merchants were quick to appreciate how valuable the service afforded by the electric line would be to them and their customers. The work of solicitation since the preliminary period has been confined largely to carload business, although an effort is made to visit once a week all of the seven towns from which the principal business is secured.

The first tariff issued by the company was based on the rates of competitive steam roads as nearly as these rates could be learned. The tariffs of the steam roads were not then open to inspection as at present, but, from his experience, Mr. Bradfield was able to arrive at substantially the same rates. The official classification was used, although a good many exceptions were stipulated and are still provided in the existing tariff.

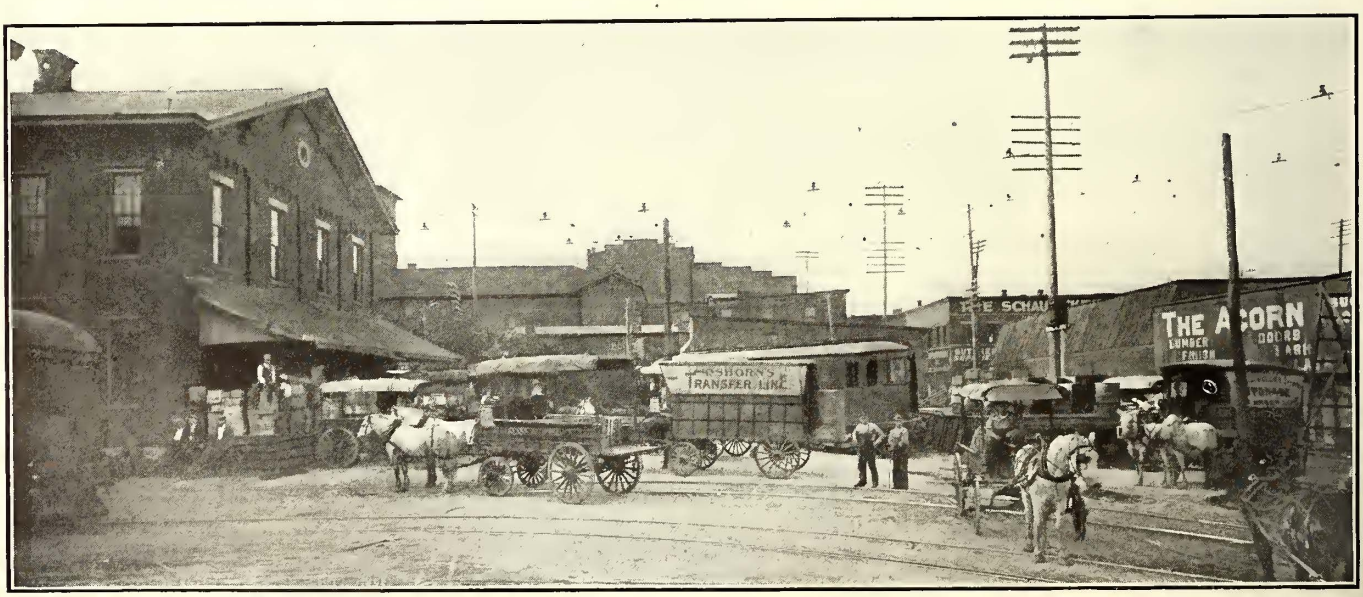
COMPETITION

The steam railway competition which the Scioto Valley Traction Company has to meet is with the Hocking Valley Railway, on the Lancaster division, and the Norfolk & Western Railway, on the Chillicothe division. The freight rates still remain practically the same as on the steam roads.

Household goods, for instance, are carried by the steam roads at the first-class rate. The Scioto Valley Traction Company charges three times the first-class rate for less than carload lots of household goods, and its agents are instructed to inform applicants of the lower steam rate, as the business is not especially desired.

The last tariff, effective on June 7, 1909, contains the special instructions to agents shown in the cut published on page 870.

The territory tributary to the Scioto Valley Traction Company is south and southeast of Columbus, Ohio. The line from Columbus to Obetz Junction is double track and from the latter point the lines branch, reaching territory which has proved to be favorable for freight development. Lancaster, at the southern terminus of the Lancaster division, has a population of 15,000. Circleville and Chillicothe, on the Chillicothe division, have respectively 10,000 and 18,000 population. Circleville is 27 miles from Columbus and Chillicothe is 50 miles.



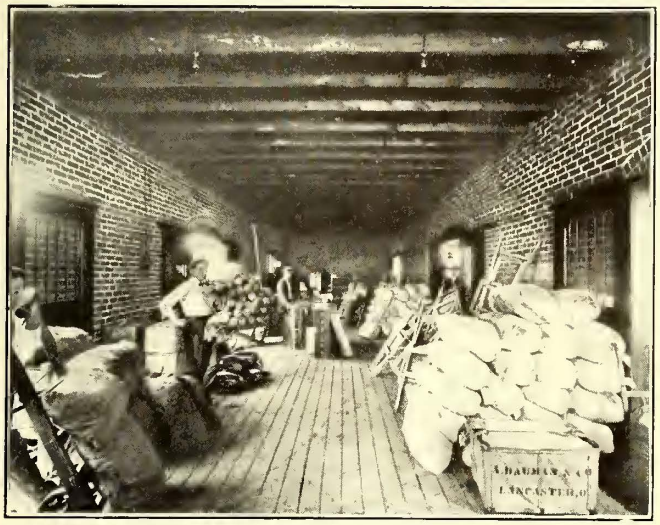
Scioto Valley Traction Company—Yard at Columbus Freight Yard

The usual arrangement of operation of the freight cars

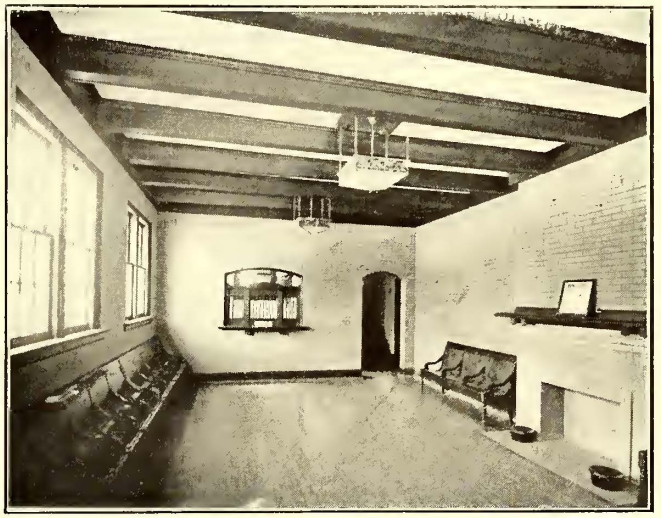
provides for two cars on each division twice a day. Under the present arrangement four trains consisting of one motor car each leave Columbus daily, two at 9:30 a. m. and two at 5:30 p. m. On the return trips freight is received at Chillicothe until 10 a. m. and 3 p. m. respectively, and at Lancaster until 1 p. m. and 8 p. m.

ORGANIZATION OF THE FREIGHT DEPARTMENT

The organization under the general freight agent may be indicated briefly as follows:



Scioto Valley Traction Company—Interior of Freight House at Lancaster, Ohio



Scioto Valley Traction Company—Interior of Waiting Room, Circleville Station

At Columbus a freight agent, freight cashier, bill clerk, one platform receiving clerk, one platform delivery clerk. These men are employed exclusively by the freight department.

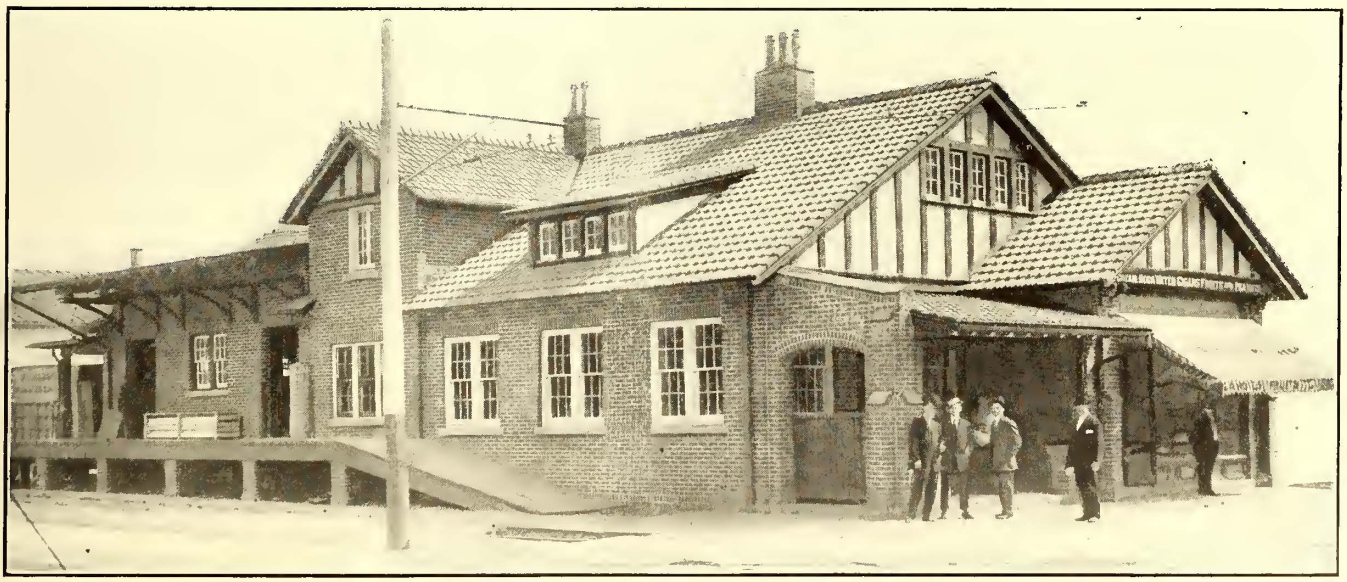
Lancaster division: Groveport, one freight and ticket agent combined; Canal Winchester, one freight and ticket agent combined; Carrol, one freight agent, a drayman who meets the train and uses such part of his time as may be necessary to attend to the freight business at that point; Lancaster, one freight and ticket agent, one clerk and one warehouse man.

Chillicothe division: Lockburn and Duvall, one man at each point to give part of his time, as at Carroll, on the Lancaster division; Asheville, a freight and ticket agent; Circleville, freight and ticket agent combined and one clerk; Kingston, freight and ticket agent combined; Chillicothe, freight and ticket agent combined and one clerk.

Freight is handled at all of the regular passenger stops. Where there are no agents freight is handled at the owner's risk, and must be prepaid. Shelter sheds have been built at all passenger stops, and regular shippers have learned that if the shipment is sent from a prepay point it must be prepaid.

DEVELOPMENT OF INDUSTRIES

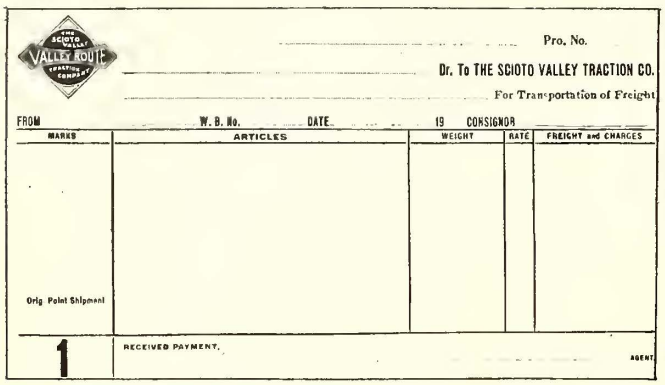
Every effort has been made to encourage industries that would add to the freight traffic of the company, and substantial results have followed from the efforts of the company in this direction. A typical instance is that of the Jefferson Spring Water Company. The water in Columbus had caused trouble, and with the encouragement of the officers of the company certain interests in Columbus located a fine spring of water near Jefferson, 19 miles from Columbus. This spring was leased and a bottling station was built adjacent to the spring. Directly after this company had started operation it began to ship, in less than carload lots, 25 carboys at a time, and the business developed rapidly with the sale of water in carboys and later of half-gallon bottles in cases, until the company started to ship full carloads. In 1907 two cars were used exclusively for the water service. During the summer of that year, when the water situation in Columbus aroused particular agitation, the shipments aggregated 6 or 7 carloads a week. Each carload contained 500 to 800 carboys or the equivalent. These cars bear the name of the water company, and are run with regular freight trains as trailers. The company has



Scioto Valley Traction Company—Exterior of Circleville Freight and Passenger Station

enlarged its business by shipments to more distant cities than Columbus, and by manufacturing ginger ale and carbonated waters.

Strawberries, melons and other fruits have been handled with advantage to the company and the producers and the consumers. When the freight service was started and traffic possibilities were under consideration, it was apparent that some business would be secured from fruit growers if the proper service was afforded. Farmers in the territory had been in the habit of picking berries in the afternoon and traveling all night in order to have their produce in the markets in Columbus early in the morning. After trips over the dusty roads, however, the condition of the berries was frequently impaired. Because of the improved facilities offered by the traction company, it is believed by Mr. Bradfield that an increase of 100 per cent has taken place in the acreage of tributary country devoted to the cultivation of small fruits. During the first season the company handled 3500 bushels of berries, the majority of which were strawberries; in the following season, that of 1907, about 6500 bushels were carried, and in 1908, about 10,000 bushels. In 1909 and 1910, owing to weather conditions, the crop of berries was not as good. During the berry season last year a trail car was sent to Canal Winchester, which is in the center of a good berry district, attached to the regular freight car leaving Lancaster at 8 p. m. The company has had the same experience with cantaloupes, and hauled to Columbus last year 3000 or 4000 barrels of these melons.



Pro. No. .....

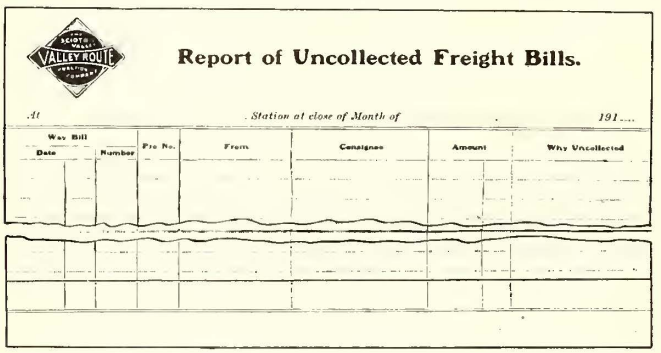
Dr. To THE SCIOTO VALLEY TRACTION CO.

For Transportation of Freight

FROM ..... W. B. No. ..... DATE ..... 19 CONSIGNOR .....

MARKS	ARTICLES	WEIGHT	RATE	FREIGHT and CHARGES
Orig. Point Shipment				
1	RECEIVED PAYMENT.			AGENT

Scioto Valley Traction Company—Part I. of Expense Bill



Report of Uncollected Freight Bills.

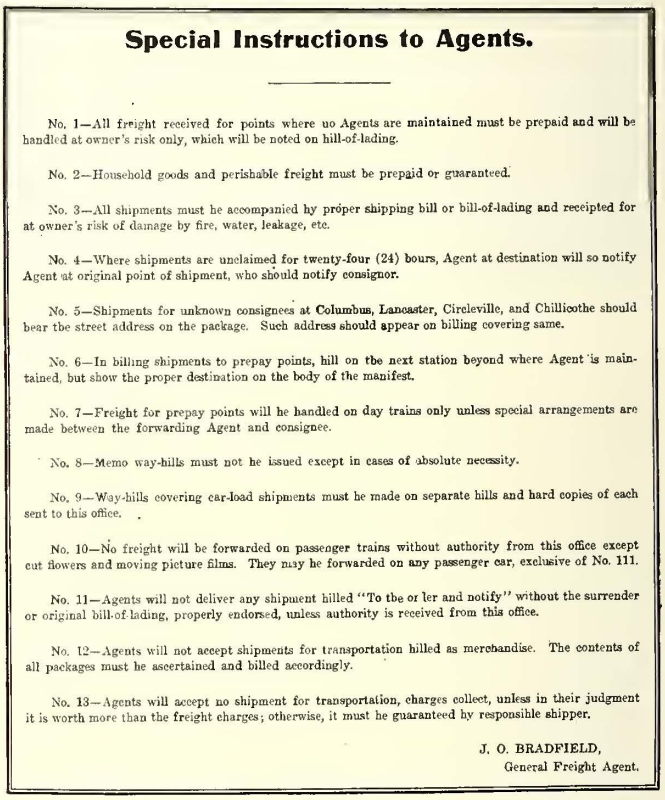
At ..... Station at close of Month of ..... 191....

Way Bill Date	Way Bill Number	Pro No.	From	Consignee	Amount	Why Uncollected

Scioto Valley Traction Company—Form of Report for Uncollected Freight Bills

On the Chillicothe division there are several large canning factories which put up mostly tomatoes, corn, peas and beans. In June and July special service is furnished by the company for this business, and this has been developed by the consignment of special cars during the season when the peas are picked and shelled and also later when the sweet corn and the beans are gathered. These cars are operated between Kingston, where vegetables are grown, and Chillicothe, where the canning plants are located. This special service enables the canning companies to shell the peas and beans before shipment, and the quick service afforded by the special car is an advantage that could not be secured by wagon service or any service that would be afforded by a steam line. For this car the company has a minimum charge of $25 a day for 6 hours. During this day six or seven trips would be made. If the car is kept longer than the time specified $3 an hour extra is charged, and a fraction of an hour is considered as one hour. The peas and beans are handled in a passenger car from which the seats have been removed in part, enabling it to carry improvised holders by the use of which both the car and the vegetables are protected. The corn is handled in ordinary gondola cars at carload rates. A further extension of this character of service has been made possible by the development of farms for the cultivation of tomatoes at Canal Winchester. Last year 50 carloads of tomatoes were hauled at carload rates from Canal Winchester to Circleville. Fifteen or 20 carload lots of pumpkins were hauled between the same towns.

The milk business of the company has increased month by month. When this was started it was a very slight factor in the total business, but it has improved to such an extent that it is believed now that the company will be justified in starting a special milk train in a year or thereabouts. Revenue from the milk business is not included in the statement of gross earnings from freight, published elsewhere.



Special Instructions to Agents.

No. 1—All freight received for points where no Agents are maintained must be prepaid and will be handled at owner's risk only, which will be noted on hill-of-lading.

No. 2—Household goods and perishable freight must be prepaid or guaranteed.

No. 3—All shipments must be accompanied by proper shipping bill or bill-of-lading and receipted for at owner's risk of damage by fire, water, leakage, etc.

No. 4—Where shipments are unclaimed for twenty-four (24) hours, Agent at destination will so notify Agent at original point of shipment, who should notify consignor.

No. 5—Shipments for unknown consignees at Columbus, Lancaster, Circleville, and Chillicothe should bear the street address on the package. Such address should appear on billing covering same.

No. 6—In billing shipments to prepay points, hill on the next station beyond where Agent is maintained, but show the proper destination on the body of the manifest.

No. 7—Freight for prepay points will be handled on day trains only unless special arrangements are made between the forwarding Agent and consignee.

No. 8—Memo way-hills must not be issued except in cases of absolute necessity.

No. 9—Way-hills covering car-load shipments must be made on separate hills and hard copies of each sent to this office.

No. 10—No freight will be forwarded on passenger trains without authority from this office except cut flowers and moving picture films. They may be forwarded on any passenger car, exclusive of No. 111.

No. 11—Agents will not deliver any shipment billed "To the or ler and notify" without the surrender or original bill-of-lading, properly endorsed, unless authority is received from this office.

No. 12—Agents will not accept shipments for transportation billed as merchandise. The contents of all packages must be ascertained and billed accordingly.

No. 13—Agents will accept no shipment for transportation, charges collect, unless in their judgment it is worth more than the freight charges; otherwise, it must be guaranteed by responsible shipper.

J. O. BRADFIELD,
General Freight Agent.

Scioto Valley Traction Company—Instructions to Agents

FREIGHT EQUIPMENT

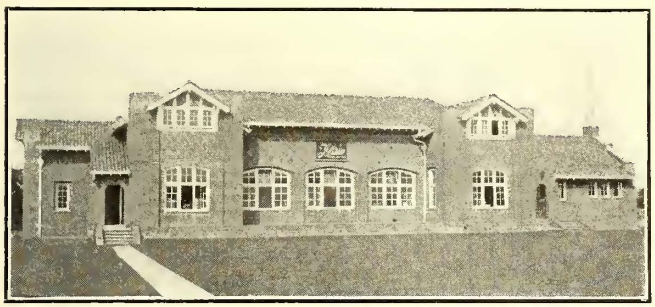
The equipment in use for the freight service exclusively consists of three baggage motor cars and nine freight trail cars. The freight trail cars are used for general merchandise. They are attached to the motor cars, and are also used generally for the carloads. The amount of business usually justifies the shipment of about six fully loaded trail cars a week to Lancaster, and about the same number in this period to Circleville. The company has five gondola cars, which are used for construction, but are employed occasionally for freight service to and from the smaller stations on the lines. Regular platform scales have been provided at Columbus and Lancaster and Circleville, and portable scales are used at the other stations. Proper sidings are provided at all stations for handling carload and less than carload business. Each freight train is operated by a conductor, a motorman and a brakeman. The company up to the present time has not developed any extensive interchange of traffic with other electric lines, but this class of business is constantly increasing. A considerable volume of carload business has been handled. This has consisted of shipments of grain, household goods, hay, straw, lumber, mill

work, brick, sand, gravel, drain tiles, etc. No coal has been hauled, but the carload business has included several shipments of horses and other live stock.

The forms used for reports to the general freight agent and F. K. Young, the auditor, are practically identical with those in use by steam lines. The practice in billing is substantially the same as that followed by steam lines, but carbon copies are made of nearly all reports, instead of tissue copies. The form of expense bill in use at the larger stations is indicated in the accompanying illustration. Of the three copies made for each shipment, No. 1 is issued for the receipt for the consignment, No. 2 is the receipt for the shipment as filed with the local office, and No. 3 is issued as the delivery ticket for the drayman. Mr. Bradfield has also inaugurated the practice of having the agents telephone the general freight office systematically regarding goods that are over or short. At a certain period of the day all the agents on the lines telephone the general freight office at Columbus regarding all discrepancies of this nature. If there are no discrepancies a note to that effect is made. A record of the report from each station is kept, and rapid comparison of the reports in each case makes it possible to straighten out mistakes of this nature immediately. Where goods are carried over or cannot be found the regular form following the steam railroad standard is provided for the report.

OPERATION OF FREIGHT SERVICE OF THE SCIOTO VALLEY TRACTION COMPANY.

	Gross freight revenue.	Gross freight pounds.	Freight car miles.	Freight revenue per car-mile.	Aver. daily freight car-miles
December, 1905.....	$1,121.91	923,697	6,835	$0.1641	262.88
June, 1910.....	5,082.21	4,947,055	14,628	.3474	562.6
Year ended—					
Dec. 31, 1906.....	31,228.78	28,512,909	103,897	.3006	340.64
March 31, 1907.....	34,412.59	32,641,429	105,025	.3276	343.22
June 30, 1908.....	43,764.89	39,715,104	128,836	.3396	419.66
June 30, 1909.....	48,033.57	52,209,835	137,957	.3482	450.55
June 30, 1910.....	50,934.27	57,129,759	151,882	.3353	496.34



Scioto Valley Traction Company—Plant of Jefferson Spring Water Company

The form of way-bill used by the company provides that three copies shall be made at one time by the use of carbon paper, comprising respectively the original, the auditor's copy and the agent's copy.

The accompanying table gives a record since the establishment of the freight service of the following: Gross freight revenue; gross freight in pounds; freight car mileage; freight revenue per car-mile; the average daily freight mileage. During the 27 days in which business was done during December, 1905, the total gross freight revenue was $1,121.91 and it has increased rapidly since that time, reaching the maximum for any one month of $5,481.26 in June, 1909. The record of several other months has reached nearly this total. The largest amount of gross freight carried in any one month was recorded in November, when a total of 7,576,142 lb. was reported. The freight car mileage has varied materially. The freight revenue per freight car-mile has extended from 16.41 cents in December, 1905, to 41.14 cents in September, 1908. No attempt has been made to separate the expense as between passenger and freight, but the management expresses its conviction that the freight business yields its share of the profit required to make the enterprise a success.

The total number of claims received from December, 1905, to July 31, 1910, was 404. They were as follows: Claims for loss, $345.49; claims for damage, $651.23; claims for switching and drayage, $275.60; claims for overcharge in revenue, $224.58; total, $1,496.90. The total amount of claims which has been declined, reduced or withdrawn was $259.39. The total amount asked for damage to baggage, one claim, was $13.75. No claim has been made for loss to baggage.

Mr. Bradfield states that, in his opinion, of the total business in less than carloads between local points on the lines the company handles 90 per cent and the steam roads the balance.

Frank A. Davis, president and general manager, in discussing the results of the freight service in the light of the experience of the company, states that, in his opinion, higher freight rates are justified by the promptness with which a shipment is delivered by the company.

CONSTRUCTION OF PARTIALLY COMPETITIVE LINE APPROVED IN WISCONSIN

The application of the Milwaukee & Fox River Valley Railway Company for a certificate of public convenience and necessity has been granted by the Railroad Commission of Wisconsin. The certificate authorizes the construction of the proposed interurban line in its entirety from Milwaukee to Cedarburg, Plymouth, Chilton, Stockbridge, Appleton, Kaukauna, Menasha and Fond du Lac. During the proceedings before the commission the principal objector to the issue of the certificate was the Milwaukee Northern Railway, which operates an interurban line between Milwaukee, Cedarburg, Port Washington and Sheboygan.

An application for the certificate was filed by the new company on March 13, 1908. It stated that the company was capitalized at $75,000, of which $25,000 was common stock and $50,000 preferred. Of the total stock $40,200 has been subscribed and $25,850 paid in. The proposed right-of-way had a width of 66 ft. throughout its entire length. The right-of-way for a distance of approximately 8 miles was owned and construction was in progress.

At the hearing on the application on April 14, 1908, the Milwaukee Northern Railway filed its objections, stating that public convenience and necessity did not require the construction and operation of the proposed line and also alleging certain irregularities. Objection was filed by the Fond du Lac & Northeastern Railway Company on May 5, 1908, to the issue of the certificate. This company charged that its contemplated line would occupy at certain points the same territory as the proposed line of the new company. In a decision rendered on July 3, 1908, the commission denied a motion for an order dismissing the application and ordered the case to a hearing on its merits.

Amended applications and objections were filed and hearings followed. An abstract of the decision, so far as it touches points of general interest, follows:

"Various estimates were introduced with respect to the probable volume of the passenger business. Like all other estimates, more or less uncertainty exists with respect to them. We think the testimony fairly shows that there is great promise of a large development of local passenger business in the territory between Cedarburg and Milwaukee and along the east shore of Lake Winnebago, and that there will be the usual local movement between all other points, especially the points between Plymouth and Cedarburg. Because of the existing facilities on the steam and electric lines in the Fox River Valley south to Fond du Lac and thence to Milwaukee, we apprehend that no great reliance should be placed upon the immediate development of through passenger business between Milwaukee and the Fox River Valley.

"Statements of the amount of grain and other farm products and live stock produced in the various townships at best afford little definiteness in regard to the quantity of these products which the proposed railway may convey to market at a profitable rate. The objector placed much stress upon the relatively great increase in the investment in equipment, stations and

terminals, and the increased cost of operation, which would result from the attempt to do a regular freight business. We do not believe that the record is conclusive upon this point. It should be added, however, that in our judgment the estimates of the freight business do not constitute the decisive factor with respect to the proposed line.

"This suggests that the differences in the estimates of the cost of operation of the proposed line are relatively small, compared with the differences existing among the various estimates of the cost of construction. It is clearly impossible for any man or body of men to ascertain in advance with substantial accuracy the results of operation of a project of the magnitude here involved. Doubtless, actuated primarily by motives of economy, the engineering work of the petitioner was somewhat loosely done, and in many respects the objecting Milwaukee Northern Railway appears to be in possession of a more detailed knowledge of the engineering features of the project than the petitioner. After carefully considering the different estimates of the cost of construction, the volume of traffic and the revenues to be derived therefrom, we are of the opinion that, while the project doubtless involves many uncertainties, these uncertainties do not create a risk of such magnitude as to justify this commission in denying promoters and investors the privilege of assuming it. We are inclined to the view that these risks are no greater than the risks which have been assumed many times heretofore in the projection of new railways which have since become useful and profitable institutions. There can be no question regarding the public service which the proposed line may perform in behalf of the territory through which it expects to operate; and no one can tell exactly what the financial results will be of operating a new railway through a territory the greater part of which has never before enjoyed the facilities of a near-by line.

"It was one of the purposes of the statute under which this application is made to insure the public against the undertaking of unusually hazardous enterprises. It was doubtless contemplated to prevent the projection of lines for speculative purposes and through which the innocent purchaser would be made to suffer losses. The proposed line has been investigated at every point with sufficient thoroughness to take it out of the class of purely speculative ventures and place it upon a basis of reasonably sound business promotion. The uncertainties with respect to the probable results of operation of the project are no greater than the uncertainties which generally exist in new ventures of this character, and they are not great enough to warrant this commission in withholding the certificate which will afford investors the opportunity of trying out their scheme.

The chief, and in a large sense the only, objector in this proceeding is the Milwaukee Northern Railway. The keystone of its objection is the threatened invasion of its profitable field in Cedarburg and some of the territory between Cedarburg and Milwaukee. The Cedarburg business is doubtless important to the Milwaukee Northern. But since the whole of that part of this business which is in controversy here amounts to only a fractional part of 1 per cent upon the investment in the objector's line, it can scarcely be said to be vital. If this business were in reality vital, and the life of the objector depended upon it, we should be in duty bound to deny the certificate to the applicant. Attributing an exaggerated importance even to the estimated figures representing the inroads which it is supposed the proposed line will make upon the revenues of the Milwaukee Northern, it is clearly demonstrable that the financial success of the Milwaukee Northern is no way dependent upon that part of the receipts from traffic at Cedarburg which is in question here.

"Historically speaking, the convenience and necessity law was probably enacted to meet exactly the situation which this petition has created, and to avoid the losses and excessive burdens upon the public which have resulted from needless paralleling of railways, of which the history of railways in the United States affords many convincing illustrations. There is reason to believe that it was a matter of common knowledge on the part of members of the legislative committee, if not of the Legislature, that such a contingency would arise in this particular locality. The Legislature doubtless intended that, through the administration of this law, destructive competition and rate wars, and competition in all forms injurious to the public interest, should be prevented. The Legislature could not have desired to eliminate all competition absolutely. If this had been its desire, what would have been simpler than to say it in so many words? The law does not say that it shall be made the instrument for eliminating all competition in any form whatsoever at every point. If such a construction were to be placed upon the law, it would in most, if not in all, cases be impossible for any railway to be constructed in the future to enter any city in which there is an existing railway, because it is axiomatic that in the railway world, within proper limitations, every railway competes with every other railway, largely independent of the exact geographical location of the competitors.

"The possibility of a rate war between the project and the objector was repeatedly touched upon in the proceedings. Such a possibility unquestionably exists, and a rate war would with certainty cut deeply into the revenues of the existing as well as of the proposed line. We assume, however, that it is fully within the power of this commission to prevent such a rate war and to compel the competitors to charge a rate which is reasonable under all the circumstances in the case. This power is clearly lodged with the commission.

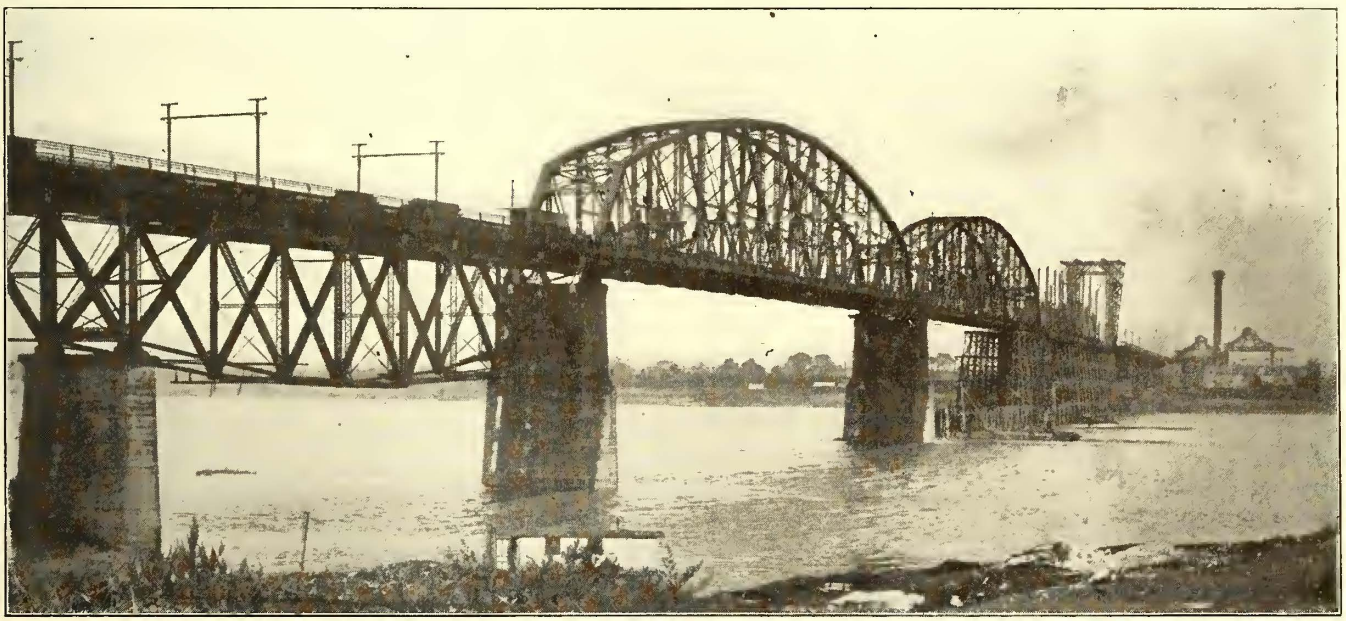
"Closely associated with the importance of the Cedarburg business to the objector is the possibility of the construction of only that part of the petitioner's proposed line extending from Milwaukee to Cedarburg. As the law now stands, the commission has no authority to authorize the construction of a portion of a proposed line after having determined that public convenience and necessity require the construction of the entire line. It follows that if the statute is to have an efficacy in accomplishing the purpose of its enactment, it must be held that authority to construct a line as an entirety does not imply authority to construct only a part of such line and to abandon the remainder; otherwise the prime purpose of the law might be defeated in many instances. We should never permit the certificate of authority to be used as a subterfuge to attack or weaken the investment of the Milwaukee Northern Railway by allowing a line to be built from Milwaukee to Cedarburg. We would neither approve the plans and specifications for such a line nor authorize its operation. It seems prudent to make these observations here in order that the investors in the project may be fully advised, in advance of their undertaking, of the extent of the obligation to which the petitioner or its successor will be held in the premises. Counsel for the petitioner fully realizes the gravity of the situation in which the objector's investment might be placed if perchance under the authority of the certificate a competing line, with Cedarburg as its northern terminus, should be constructed from Milwaukee, and with commendable justness and fairness he proposed to accept the certificate with limitations.

"We do not deem it essential to incorporate in the certificate any limitation of the character suggested, as the certificate will, by its terms, limit the authority thereby granted to the construction of the line as a whole.

"The power of the commission, which it will not hesitate to exercise properly when the occasion arises, to prevent rate wars, and to refuse approval of plans and specifications and authority to operate only that portion of the line between Cedarburg and Milwaukee, and the stipulation voluntarily entered into on the part of the petitioner to build south of Plymouth and north of Elkhart and north of Cedarburg and south of Cedarburg, mile for mile, remove the principal grounds of opposition urged by the objector, which, in our judgment, constitute the strongest objections which were raised against the project from the point of view of protection contemplated in the public convenience and necessity law to existing railway enterprises."

OPENING OF THE McKINLEY ELECTRIC BRIDGE

Regular service over the McKinley Electric Bridge and the new St. Louis terminal tracks of the Illinois Traction System was begun on Monday, Oct. 3. The Illinois Traction System, with nearly 600 miles of interurban road in Illinois, is now operating local and limited cars across its new bridge and through the wholesale section of St. Louis to the heart of the hotel and commercial district of that city. An illustrated description of the construction features of the extensive terminal project which makes this interstate service possible was presented in this paper for Jan. 22, 1910. The McKinley bridge was designed and built to furnish two tracks with carrying capacities of 10,000 lb. per lineal foot of track and two paved driveways, each 14 ft. wide, with carrying capacities of 3000 lb. per lineal foot. The structure includes three river spans, each 523 ft. long, and five shore spans, two of which are 250 ft. long and three 150 ft. long. The approach on the Missouri side passes over a freight terminal property of 24 acres owned by the Traction System, and over the first story of a 2-story interurban passenger station at the intersection of the bridge approach with Broadway. Two and one-half miles of double-track line laid with 125-lb. rails on 12-ft. centers connect the



New McKinley Bridge Over Mississippi River

Broadway passenger station with a terminal property located at Twelfth and Lucas Streets, St. Louis, one and one-half blocks north of the Jefferson Hotel. At the latter site a large passenger station and office building, 12 stories in height, will be erected. An express warehouse at this location is now under way. This fireproof structure was described in this paper for Sept. 24, page 462. The express terminal is 262 ft. long by 88 ft. wide and two stories high.

The service just inaugurated includes limited trains between Springfield and St. Louis, 100 miles, every two hours between 4:45 a. m. and 6:45 p. m.; sleeping-car service daily between St. Louis and Peoria; local cars between St. Louis and Springfield on a 2-hour headway between 5 a. m. and 10:30 p. m., and a local street-car service in St. Louis and across the bridge to Venice and Granite City. The existing service into East St. Louis will not be discontinued. The office car of H. E. Chubbuck, vice-president of the Illinois Traction System and the Western Railways & Light Company, on Sept. 29, was the first interurban equipment to cross the bridge into St. Louis.

At a luncheon given recently by the representatives of the Illinois Traction System, and attended by the mayors of St. Louis and surrounding towns, and representatives of 38 organizations in St. Louis, plans were laid for ceremonies in November to celebrate the inauguration of the enterprise.

COST OF ELECTRICAL PRODUCTION IN A PLANT WITH RAILWAY LOAD

The power plant of the Hyde Park Electric Light Company, in one of the suburbs of Boston, has the distinction of supplying more electrical energy for street railway service than any other central station in Massachusetts. The return of the company for the year ended June 30, 1910, was recently filed with the Board of Gas and Electric Light Commissioners, and it shows that of a total energy sale and distribution of 4,103,384 kw-hours, 88.5 per cent, or 3,636,390 kw-hours, were supplied to electric railway feeders. The total output of the plant at the busbar for the year was 4,357,648 kw-hours. The plant is under the management of the Old Colony Street Railway Company.

The return shows that the maximum load upon the station occurred on Jan. 14, 1910, the peak output being about 3439 amp. The maximum load on the day of least output during the year was 1300 amp, the date being Aug. 8, 1909. The station equipment consisted of nine boilers of an aggregate rating of 1350 hp, operating at 115 lb. steam pressure, and five reciprocating engines driving five d.c. 500-volt generators and two alternators. The total generator capacity was 1775 kw. The two largest generators in the station were rated at 850 kw and 525 kw, and were each driven by a direct-connected cross-compound engine. The station payroll includes three engineers, three firemen and two coal passers. The cost of manufacture at the busbar was as follows for the year:

COST OF PRODUCTION (NET AT SWITCHBOARD), HYDE PARK, 1910.

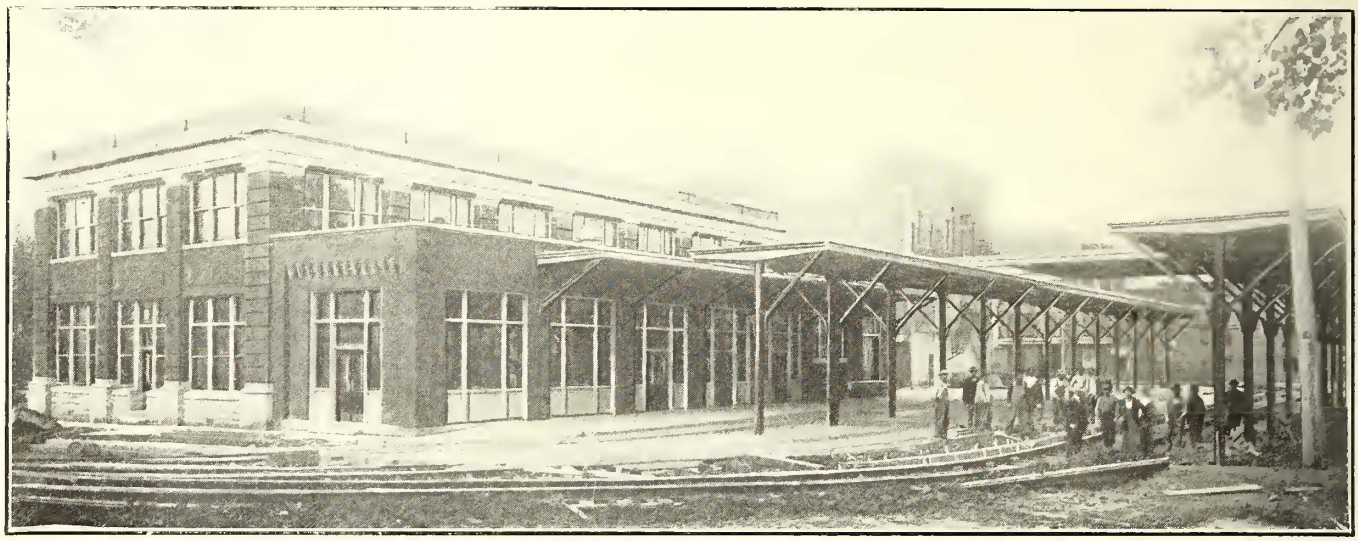
Fuel	$34,228.04	or 0.78 cents per kw-hour
Oil and waste	746.45	
Water	707.63	
Wages at station	9,609.76	or 0.22 cents per kw-hour
Station building repairs	607.44	
Steam equipment repairs	2,966.14	
Electric equipment repairs	652.71	
Minor station tools	776.19	
	$50,294.36	or 1.15 cents per kw-hour

The coal burned was bituminous at $3.94 per ton and No. 3 buckwheat at $3.17 per ton.

An electric railway system to connect all parts of Bermuda is projected by a Canadian company which is now seeking a charter. The cost of the system is estimated at $1,000,000, the length of the road is to be 30 miles. The company's manager says that all equipment for the line is to be purchased in the United States.

NEW PASSENGER STATIONS OF THE OHIO ELECTRIC RAILWAY

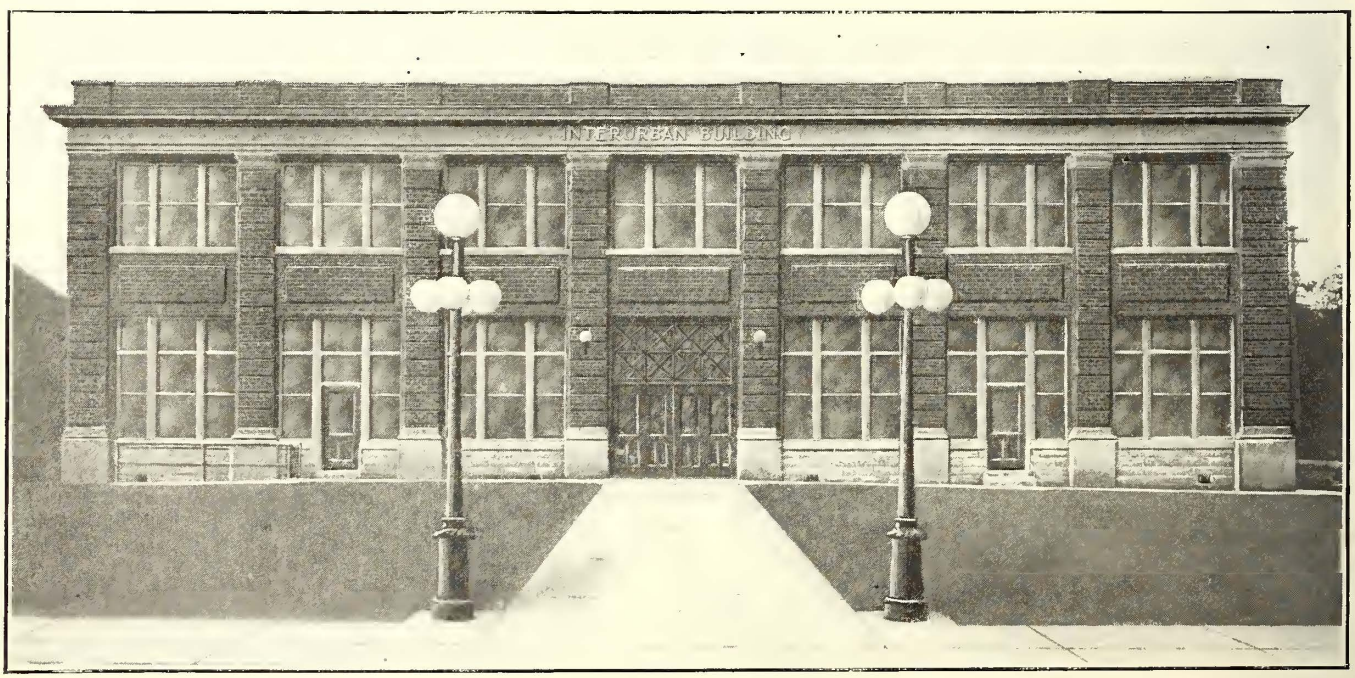
Lima and Springfield, Ohio, are two of the most important junction points on the interurban lines of the Ohio Electric Railway. From Lima this company's lines extend north 72 miles to Toledo, northwest 40 miles to Defiance, west 60 miles to Ft. Wayne and south 75 miles to Springfield. Likewise, Springfield is the terminus of lines radiating in four directions, and offers direct routes to Indianapolis, Cincinnati, Columbus and Lima. By reason of the importance of these two junction points, the company has just constructed especially attractive station buildings, which provide commodious waiting rooms, large track space under cover and ample headquarters for the operating officials.



Ohio Electric Railway—Covered Platforms at the Rear of Lima Station

dence district. The accompanying engraving shows the ground and track plan at the Lima station. The building, which is 100 ft. x 71 ft. in ground dimensions, is set back 75 ft. from the street line. The space between the front of the building and the street has been sodded.

The track facilities provide for passing cars around the building and onto the street again without wyeing. Intending passengers will enter the station from the street side, pass through the waiting room and into a shelter which faces the loading tracks. Four tracks, each 200 ft. long, extend across the full length of the block at the rear of the station. Island platforms have been built between each pair of tracks, and all of the platform space is protected by umbrella sheds. The entire platform has been paved with concrete. Reference to the ground plan of the new Lima terminal will indicate the flexibility of the operation which the track lay-out will afford.



Ohio Electric Railway—Front Elevation of New Station at Lima.

LIMA INTERURBAN STATION

The new station at Lima, known as "The Interurban Building," is located one block east of the most important business corner in the city, and is readily accessible from the steam railway depot. Sufficient property has been purchased to permit of a generous extension of the building, and also to lay out attractive grounds in keeping with the neighboring resi-

A plan view of the first floor of the new Lima station is presented herewith. On this floor the space is subdivided to form the following rooms: General waiting room, 25 ft. x 55 ft.; waiting concourse, 20 ft. x 69 ft.; ticket office, 12 ft. 6 in. x 20 ft. 4 in.; baggage room, 15 ft. x 20 ft. 4 in.; lavatories and retiring rooms for men and women, 13 ft. 10 in. x

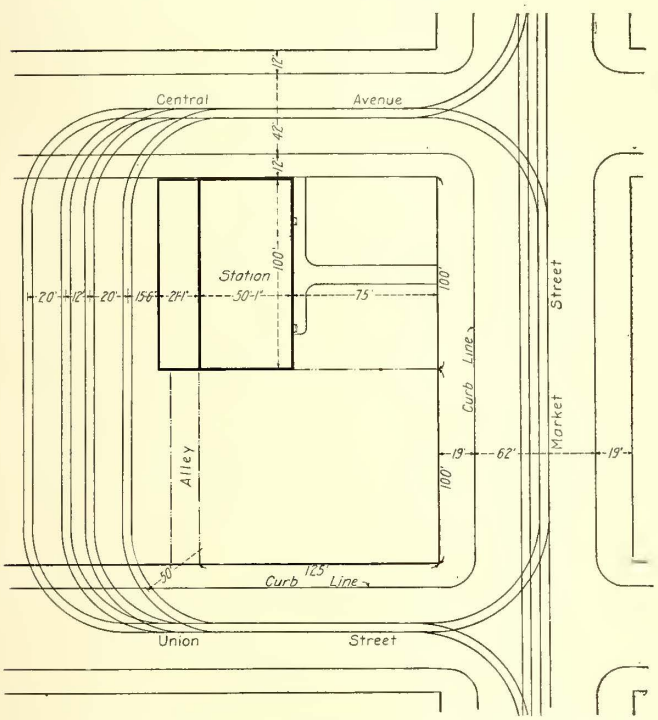
46 ft.; a store, 21 ft. x 27 ft.; electric light office, 21 ft. x 27 ft.; restaurant, 46 ft. x 28 ft.

The second floor contains 12 offices and an undivided space 21 ft. x 64 ft. The offices will be assigned to the following members of the operating staff: Superintendent, chief clerk, dispatchers, cashier, storekeeper, district passenger and freight agent, claim agent. Toilet rooms of generous size are provided on both floors of the new building.

The new Lima station is constructed of dark red brick and ornamented with white stone. The floors are supported by structural steel frames, which include 15-in., 38-lb. I-beam stringers and 8 in. I-beam connections carrying a reinforced concrete floor. On top of the concrete are 2-in. x 2-in. beveled nailing strips placed on 16-in. centers. These strips carry a ⅞-in. matched floor. The space between the concrete and the floor boards is filled with cinders. The ceilings are made of stiffened metal lath tied to the floor beams and covered with plaster. The first floor has a head room of 14 ft., and the offices on the second floor have a head room of 10 ft. 6 in.

SPRINGFIELD TERMINAL STATION

The ground plan of the Springfield station is of particular interest because of the unique way in which the tracks and

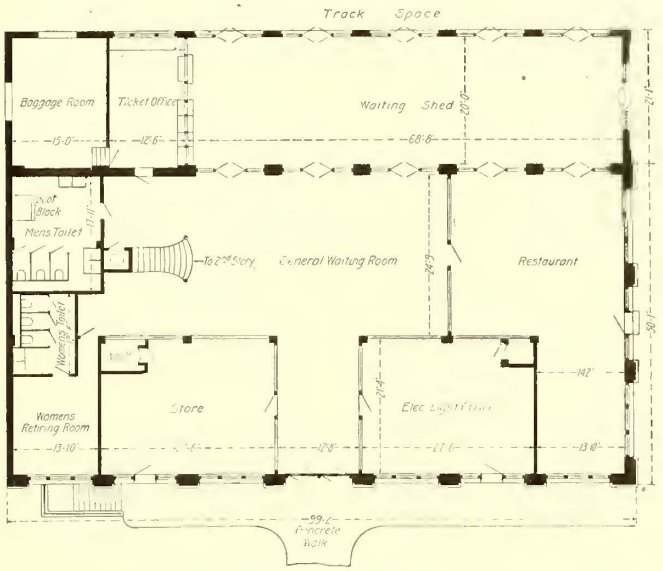


Ohio Electric Railway—Ground Plan of the Lima Station

building have been located. The company's property is a rectangular-shaped corner lot 198 ft. on each side. Double-track interurban lines pass both sides of the property, and the cars operate around the curves at the corner. The new station building, which is approximately triangular in plan, has been set exactly at the corner of the lot, and the tracks have been placed at the rear of the building. This arrangement, as illustrated, affords easy curves for the cars passing by the station and confines the loading to company property. As at Lima, four loading tracks are provided, and the platform space is covered with umbrella sheds of the design here illustrated.

The Springfield station is a structure of similar wall design to the Lima Interurban Building earlier described, and in general has the outline of a right-angle triangle with 100-ft. sides. The diagonal side of the triangle faces the four loading tracks.

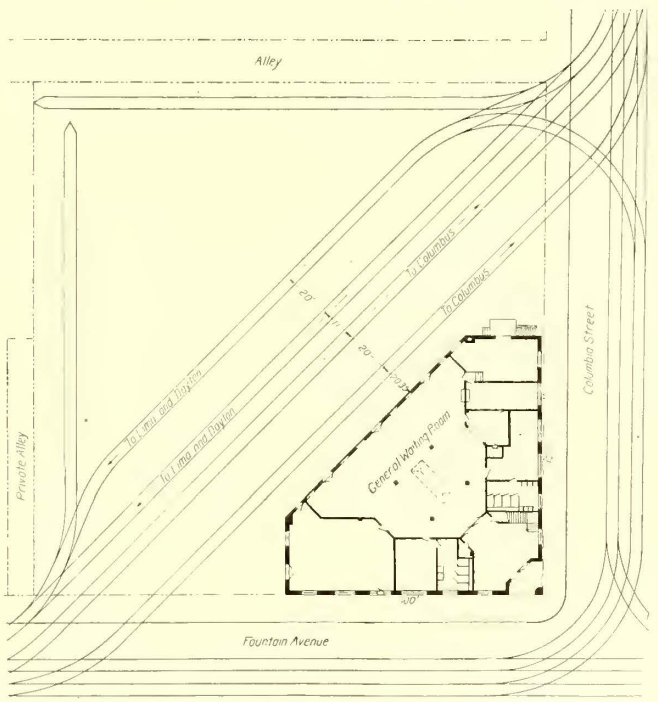
A plan of the first floor of the Springfield station is reproduced herewith. It will be noted that the subdivisions of the first floor provide a large entry way leading directly from the street into a general waiting room. The entrance hall is approximately 14 ft. x 30 ft. in floor dimensions, and the general waiting room has a frontage of 88 ft. on the track side of the building and an extreme depth of 56 ft. It is amply lighted by windows on the track side of the building, and by a skylight directly in the center of the ceiling. Grouped about the waiting room on the street sides of the building are the following rooms: Restaurant, 28 ft. x 42 ft.; women's waiting room, 15 ft. x 20 ft.; women's toilet room, 13 ft. x 20 ft.; entrance hall on the corner, 14 ft. x 30 ft.; men's toilet, 12 ft. x 20 ft.;



Ohio Electric Railway—First Floor Plan of the Lima Station

men's waiting room, 25 ft. x 20 ft.; a ticket office, 13 ft. x 17 ft.; parcel room, 11 ft. x 28 ft., and a baggage room, 15 ft. x 28 ft. The restaurant and baggage room are close to the track side of the building.

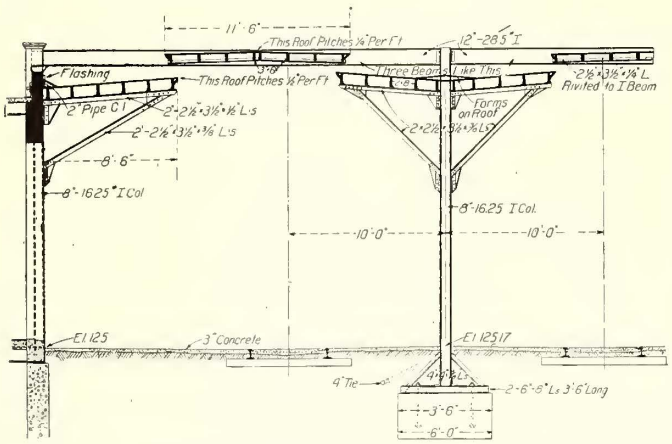
Springfield is the operating headquarters of the Ohio Electric Railway, and so, in the new terminal station, generous



Ohio Electric Railway—Ground Plan of the Springfield Station

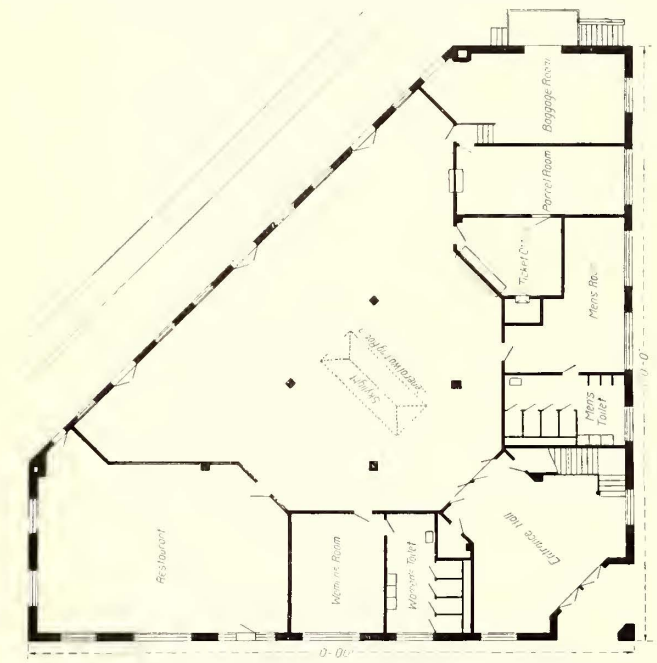
accommodations have been provided for the operating officers. The building is three stories high. On the second floor are suites of offices for general manager, superintendent of transportation, chief engineer, power station engineer and general freight and passenger agent. In addition, rooms are provided for the dispatcher, ticket stock, draftsmen, chief clerks and

stenographers. These suites of offices are lighted from both the street and track sides of the building. The third floor of the Springfield station will be set apart for the use of the auditing department. On this floor are an office, 15 ft. x 20 ft.,



Ohio Electric Railway—Section of One Half of Platform Covering at the Lima and Springfield Stations

for the auditor; a vault, 10 ft. x 10 ft.; a retiring room for the women, 10 ft. x 10 ft.; women's toilet room, 20 ft. x 11 ft. In addition to these subdivisions are two large undivided spaces. One, 21 ft. x 71 ft., will be occupied by the clerks in



Ohio Electric Railway—First Floor Plan of the Springfield Station

the auditing department, and the other, 27 ft. 6 in. x 54 ft., will be used as a storeroom for the auditing department. The third-floor rooms have daylight illumination on all sides.

Birmingham, England, employs 1523 men on its street car lines. Motormen and conductors on the city cars work six days of 10 hours each per week. Motormen start at 12 cents an hour for the first year and rise to 12½ cents for the second and to 12 2/3 cents for the third year; the latter is the maximum wages. Conductors start at 10 cents an hour, advancing to 11 cents the second and 12 cents the third year. Uniforms are furnished to motormen and conductors. Motormen get $4.86 extra every three months when they have had no avoidable accident. Including uniform and holidays paid for, it is calculated that the minimum wage of a motorman is about $7.60 and the maximum about $8.50 per week, and for the conductors about $6.40 is the minimum and about $7.90 the maximum.

PAPERS PRESENTED BEFORE THE MUNICIPAL TRAMWAYS ASSOCIATION

Among the papers presented before the ninth annual conference of the Municipal Tramways Association, held in Bradford, England, Sept. 21-23, were the following: "English Tramway Progress" (presidential address), by C. J. Spencer, general manager, Bradford Corporation Tramways; "The First Decade of Municipal Tramway Working," by S. Flint, chairman Leicester Corporation Tramways Committee; "Comparative Durability of Brake Shoes and Tires," by J. W. Dawson, assistant engineer, Bradford Corporation Tramways; "Tramways in Relation to Town Planning," by A. Baker, general manager, Birmingham Corporation Tramways.

Mr. Spencer said that during the past year there were in operation 2526 miles of route over which 2,659,981,136 passengers were carried. The ratio of net receipts to total capital outlay was 6.47 per cent and to net capital outlay (eliminating amounts expended on the construction or purchase of old lines and superseded constructions), 7.06 per cent. The average ratio of operating expenses to gross receipts was 63.64 per cent. There were carried 9.1 passengers per car-mile. The total investment in municipal tramways was £47,134,754. A total of £280,225 was paid toward the reduction of taxes. During the year the municipal tramways put aside 3½ per cent for sinking fund, reserve and renewal accounts, whereas privately operated street railways put aside only 1.05 per cent for the same purposes.

Mr. Flint presented some statistics of the growth of municipal tramways in England between 1899 and 1909 as follows:

	1899.	1909.
Number of undertakings	6	84
Number of miles of track	52	2,422
Number of cars	197	7,086
Number of miles run	3,374,806	197,938,433
Number of passengers	38,432,470	1,933,118,206

At the end of 1909 the capital invested in the 84 undertakings was £40,436,350. The net profit after subtracting operating expenses, interest, sinking fund, income tax and sundries was £974,944. The latter amount was apportioned partly to a reserve fund and partly toward reduction of taxes. Most of the municipal tramways had made money and where that was not the case it appeared that the power costs were very high or that the population was too small for the amount of track in operation. The prices of power varied from 0.96d. to 2¾d. per kw-hour.

Mr. Dawson's paper dealt with experiments undertaken to ascertain the comparative durability of various grades of brake shoes and their wearing effect upon steel tires. Twenty grades of shoes were tried. These included gray cast irons, white irons, chilled metal and insert shoes. In service tests one standard shoe and one with which it was to be compared were fitted to the wheels at one end of the car and two similar shoes were put at the other end. The same grade shoe was placed in diagonal positions on the track so that one shoe of each type acted upon the same axle and so made equal the retarding effort per axle. To obtain accurate comparative results of shoe wear and differences of tire wear it was necessary that each shoe should give the same retarding effort. To do this the pressure applied to each shoe had to be in inverse proportion to its coefficient of friction. This object was secured by means of a brake rigging designed by Mr. Dawson which was adjusted by links between the supplementary brake beams in proportion to the respective frictional coefficients of the shoes. As the result of experiments and a number of calculations Mr. Dawson concluded that from the standpoint of cost it was immaterial whether the shoes or tires had the greater wear. The individual shoes of each class were found to vary considerably in durability. The rate of wear of soft gray iron was more uniform than of the other shoes, but their wearing effect on the tire differed greatly. Shoes of the same grade but from different founders did not have the same frictional coefficient, durability, or wearing effect upon the tire. The tests for hardness demonstrated conclusively that shoes of equal hardness were not necessarily equal in durability, frictional coefficient or

in their effect on the tire. Chemical analyses were made of the tested shoes by F. W. Richardson, Bradford city analyst. However, metals which had the same chemical contents did not necessarily have the same properties because the various constituents combined differently in accordance with the materials used, the methods of founding and the rate of cooling. Mr. Dawson concluded that if in addition to chemical and physical tests a microscopical research was made of the structure of service shoes the combinations of their constituents would be revealed. Such a test would indicate the particular structures producing the different characteristics of the shoes and probably would enable the drawing up of standard specifications.

Mr. Baker made a strong plea for the better provision for tramway tracks when new streets are laid out. Preferably, the tracks should be laid in a reservation. At from $500 to $1,000 per acre, an addition of 6 yd. to the width of the road would cost only from $1,000 to $2,000 a mile and there would be considerable saving annually in repairs and maintenance. He was skeptical of the commercial value of the trackless trolley cars.

DISCUSSION ON ELECTRIC TRACTION AT THE BERNE CONGRESS

The eighth convention of the International Railway Congress was held this year at Berne, Switzerland. This congress meets every five years and includes in its membership many of the principal steam railroad companies in this country and in Europe. At each of the last four meetings there have been papers on the subject of heavy electric traction. The subject was considered first at the meeting held in 1895. At that time the congress passed resolutions stating substantially that there were no serious technical difficulties in the way of operating electric motor cars by the overhead system, but that the construction of electric locomotives for hauling heavy trains was still undeveloped. At the sixth congress, which took place in Paris in 1900, a resolution was passed declaring that the success attained in electric traction warranted its application on steam railroads under certain special conditions, but that it was impossible to consider the art far enough advanced for cases where heavy trains were to be operated over long distances at high speeds. The seventh congress, held in Washington in 1905, stated that electric traction should be looked upon as a useful auxiliary to steam traction for handling of certain kinds of traffic with profit and economy. It was impossible in a general statement to define those cases best suited for electric operation.

At the eighth congress, held, as stated above, in Berne this year, there were four reports on electric traction, all of which have been abstracted in this paper. These reports were presented by Prof. B. Gleichmann for Germany, George Gibbs for America, A. Hruschka for Austria, and Prof. Wyssling for Switzerland and all other countries excepting Germany, America and Austria-Hungary. In the absence of the American representative, the three members of the committee from Europe united in submitting the following to the congress as their personal conclusions:

1. The kind of current must not be selected on account of its adaptability to certain individual cases, but on the basis of its applicability to complete railway systems.

2. Electric traction affords the possibility of obtaining considerable economy in cost as compared with steam traction, especially where hydroelectric power is available. The use of electric traction will increase the capacity of a line without additional trackage.

3. A study of the conditions existing in the countries (Germany, Austria and Switzerland) referred to in the reports indicates that single-phase current is best suited for traction on main lines, although direct current and three-phase current have been found applicable under certain conditions.

4. The most favorable periodicity for single-phase current appears to be within the limits of $\frac{40}{3}$ and $\frac{50}{3}$; the potential of the contact wire should be from 10,000 volts to 15,000 volts.

The conclusions adopted by the congress by unanimous vote were:

1. Technically electric traction has made such great progress in recent years that it now affords a satisfactory solution of the problem of traction on main lines, either by electric locomotives or by motor cars.

2. Various systems are available and the selection of one or another depends on its respective suitability in each case.

3. Railway systems which propose to introduce electric traction on their lines should take steps to facilitate the interchange of rolling stock as far as possible.

SUMMARY OF DISCUSSION

The following is a summary of the discussion which took place on this subject at the meetings of the second session of the congress:

Mr. Krasny, engineer, Imperial & Royal Austrian Railways, proposed that the executive committee of the congress should call an international meeting to work out the fundamental principles governing the interchange of rolling stock on lines of international communication. He pointed out, also, that the income from electrified lines must not only cover the expenses of operation but also the cost due to the obsolescence of material rendered useless by electrification.

Mr. Niccoli, Italian State Railways, gave some data concerning three-phase locomotives. He said that the electrification of the lines near Genoa had proved profitable owing to the possibility of running heavier and faster trains. He mentioned other lines which would soon be electrified by the three-phase system, and added that tests with the single-phase system were to be made on the Turin-Pinerolo line.

Mr. Hruschka, Austria, pointed out that single-phase apparatus was suitable in all cases because single-phase locomotives could be run on sections equipped for three-phase and direct-current operation.

Prof. Merczing, Russia, presented some data on the hydroelectric possibilities of Russian rivers in connection with the electrification of Russian railways.

Mr. Jullian, engineer, French Southern Railways, gave some information concerning the electrical equipment of his company's lines. The system selected was 12,000 volts, 16 2/3 cycle, single-phase current. The type of electric locomotive would be decided upon only after experiments with several designs.

Mr. Graftio, engineer, Russian ministry, believed that it would be dangerous to give preference beforehand to any one system, such as single phase, as being the only good one. Considerations of an economical character, as well as the safety and reliability of traffic, might force one to use different systems in various cases. On two Russian lines, for instance, the study of electrification had shown that the single-phase system would be more expensive than the three-phase system; in a third case the most desirable system to use was direct current, including the partial use of a third rail. It was impossible to speak of the general electrical equipment of the railway system of such a country as Russia because the local conditions and classes of traffic differed so very much throughout that immense country that the use of various systems was inevitable.

Paul du Bois, engineer, Paris-Orleans Railway, said that up to the present time extended operating data were available only on the operation of three-phase and direct-current lines. A comparison of the figures presented in the reports showed that in reality the three systems did not differ very much from one another in regard to the cost of equipment and operation. The operating expenses with electric traction were less than steam traction. However, 3 per cent per year was too small an allowance for depreciation.

Mr. Mazen, engineer, French State Railways, agreed with Mr. du Bois. Direct current was more economical for dense traffic. Direct-current rolling stock was not as heavy and was more reliable than single-phase cars. As every system had its

advantages for certain conditions, the Congress would not be justified in recommending any one of them exclusively.

Messrs. Gleichmann, Wyssling and Hruschka opposed the assertions of Messrs. Mazen, du Bois and Graftio. They laid stress on the fact that as the subject under discussion concerned a general decision the point was not to consider the advantages of various systems, but to determine what system offered the most favorable solution for the electrical equipment of main lines. According to these speakers, also, the unity of systems was a matter of interest in simplifying international communication. The single-phase system complied with all the desired conditions.

Mr. van Lonen-Martinet, Holland, believed that the experiments so far carried out with the single-phase system were insufficient to justify its acceptance as the universal one. There was still a lack of practical experience as to the results with contact wires with 10,000 volts and upward.

Mr. Mazen thought that it would be positively dangerous for an international association to take a decided standpoint in favor of one system of electric traction. In his opinion the Congress could do no more than acknowledge that considerable progress had been made in that art. Further, Mr. Mazen proposed to waive the conclusions reached by the reporters, and on his part offered resolutions of more general character.

Prof. Wyssling expressed his consent to more general resolutions, but asked that the conclusions of the three reporters be placed upon the minutes. As previously noted, this request was carried out. The general meeting of the Congress afterward unanimously accepted a set of resolutions along the lines proposed by Mr. Mazen before the second section of the Congress.

MEETING TO DISCUSS NEW YORK SUBWAY SITUATION

A public engineering meeting was held, under the auspices of the American Institute of Electrical Engineers, at the Engineering Societies' Building on the evening of Oct. 17 to discuss the New York subway situation, and a paper on this subject was presented by Frank J. Sprague, past-president of the American Institute of Electrical Engineers. This paper was begun by Mr. Sprague at the request of the papers committee of the American Institute of Electrical Engineers, but its scope broadened and he concluded that it would be better to present it at a public meeting at which all engineers and others interested in the route and design of a new subway in New York could express their views.

MR. SPRAGUE'S PAPER

Mr. Sprague began his paper by saying that the subway question in New York has arrived at a critical period on account of the issue of plans and specifications by the Public Service Commission, First District, upon the whole or part of what is known as the tri-borough system. He then described briefly the history of rapid transit in New York, beginning with the award of the contract for the present subway to John B. MacDonald, the assignment of this contract to the Rapid Transit Subway Construction Company, the operation of the system by the Interborough Rapid Transit Company, and the lease by the latter company of the Manhattan elevated system. This system now includes 25.63 miles of route and 81.94 miles of track and possesses 590 motor passenger cars and 327 trail passenger cars. The investment, exclusive of the expense of the old Board of Rapid Transit Commissioners and the present Public Service Commission, is nearly $93,000,000, or something over $1,132,000 per mile of single track.

HISTORY OF RAPID TRANSIT PLANS

Mr. Sprague then referred to the passage of the Elsberg law limiting new rapid transit franchises to 25 years and its subsequent repeal, after experience had shown that under this law no capital could be secured to construct new rapid transit systems. He then described the subsequent proposals of the Interborough Rapid Transit Company for further extensions, the present and proposed system of the Hudson & Manhattan Railroad and the construction of the "bridge loop" and the extension along Fourth Avenue in the borough of Brooklyn.

According to Mr. Sprague, the "bridge loop" has been constructed as a four-track subway from the terminus of the Williamsburg Bridge and part way along Delancey Street and Center Street toward the present Brooklyn Bridge, and at Walker Street has tracks at grade branching sharply to the east to connect with two tracks of the new Manhattan Bridge. The section of this subway already built has been constructed with city funds. As yet no operating tenant has been secured, although it is understood that temporary leases will be made with the Brooklyn Rapid Transit Company. The present estimated cost of construction of this short section of city subway, comprising 1⅛ miles of four-track route along Center and Delancey Streets and ¼ mile of two-track route on Canal Street, a total of 5 miles of single track, is about $10,000,000. The cost of the Fourth Avenue section, about 3.9 miles of route, a short part of which is six-track, is $17,500,000. That is, these two tenantless and segregated subways have required in amount one-half the aggregate of city bonds which were issued against the construction cost of the present subway system with its 25.63 miles of route and its daily capacity of 800,000 passengers.

On Sept. 1, 1910, the Public Service Commission issued plans for what is known as the tri-borough route. (A map of this route, of the "bridge loop" and of the Fourth Avenue line was published in the Electric Railway Journal for Sept. 10, 1910, page 412, with a statement of the conditions under which bids must be presented.)

TRI-BOROUGH SYSTEM A MISTAKE

Mr. Sprague believes that, "measured by the essentials of route and method of construction, equipment and operation, and by the inexorable laws of finance," the tri-borough system was mistakenly conceived and unwisely promoted and thinks that if this construction as now planned is persisted in the result will be far-reaching disaster. He pointed out that the alternative plan of the Interborough Rapid Transit System of having a west side route south of Forty-second Street and an east side route north of Forty-second Street has a logical development and would practically double the present capacity of the present subway in the shortest time and with the least possible capital expenses. On the other hand, the tri-borough route south of Forty-second Street practically parallels the existing subway for a distance of 4 miles within a block on one side or the other. It doubles the service to the Grand Central Station, but ignores the new Pennsylvania station. It passes the entrance to the Steinway tunnel, but has no physical connection with it and no right of transfer. It has no connection, physical or otherwise, with the Williamsburg Bridge. It also parallels existing rapid transit lines of the Bronx, and the service supplied in Brooklyn is not adequate.

Mr. Sprague also considers the proposed physical design of the tri-borough system an error. It is of larger section than the present subway, which will increase the cost at least 30 per cent and will introduce many engineering difficulties. The object of this increased size is, presumably, to permit the admission of standard steam railroad cars, but the experience of transportation managers in England and on the Continent is absolutely against this dual system of operation. Mr. Sprague thinks it would be folly to permit a certain upsetting of schedules in such a subway by the entrance of irregularly timed and dissimilarly equipped cars, commanded by foreign crews, especially on a route with the enormous congestion of traffic which characterizes New York conditions. He also believes that the plan proposed in this subway of constructing solid partitions between the tracks to afford forced ventilation is a mistake. The piston system of ventilation finds its extreme illustration in the deep tunnels of the Center London Railway, where the cars, as nearly as is practicable, fit the circular shell of the tube. Yet even in this tunnel there is more or less churning of the air. Again, all air has to be taken from the street surface, where in hot and dusty weather it is neither in temperature nor purity the best to be had. Finally, if the air is to be accelerated as well as the train, more power will be

required. Mr. Sprague thinks, therefore, that it would be more desirable to omit the partitions and by external power force into the tunel air taken at a reasonable height above the street. He also criticises the specifications for equipment and schedules.

The estimated cost of the tri-borough system, exclusive of the present Fourth Avenue section in Brooklyn, is about $110,000,000, exclusive of extras and fixed charges on dead capital while waiting operating. The equipment would cost from $30,000,000 to $35,000,000 in addition.

PROPOSED PLAN

Assuming that the commission cannot make a satisfactory arrangement with the Interborough Rapid Transit Company for the extension of its route, south from Forty-second Street on Seventh Avenue and north of Forty-second Street on Lexington Avenue, Mr. Sprague believes that the commission should throw over the tri-borough plan and call for bids on a new route largely along the route proposed by the Interborough for its extensions. Such a route above the Harlem River would have branches on Mott Street and River and Jerome Avenues like the Interborough and tri-borough plans. Continuing down Lexington Avenue, past the Grand Central Station, it would cross the city somewhere between Thirty-sixth and Fortieth Streets. Thence it would run down Seventh Avenue past the Pennsylvania station to the Battery. It would connect at Canal Street with the "bridge loop," with which a physical connection could be made so that trains could be operated over the Williamsburg Bridge to Fulton Street and Atlantic Avenue and out Fourth Avenue. The subway should be continued up Seventh Avenue to Times Square, where a connection could be made with the present subway.

Such a system as an independent proposition would be an active and dangerous competitor to the Interborough, and later, if it should be desired, could be combined with the present Interborough system. This subway should be constructed of dimensions similar to those of the present subway and with alternative bids of construction and operation by private capital or construction alone with city funds.

DISCUSSION

W. J. Wilgus, consulting engineer, New York, said that the specifications for the tri-borough subway should be radically revised because of the enormous expenditure under the present plan. The route should lend itself to continuous train operation to eliminate any change of cars in local traffic, and it should harmonize with the present subway line to avoid duplication of facilities. Not only should the design be economical, but the construction and operation contracts should be handled simultaneously to insure an immediate return on the investment. The absence of trackage connections between the three different parts would mean the creation of congestion points like that at the Brooklyn Bridge terminal. As thus laid out, the tri-borough subway would be seriously handicapped in competing with the existing system for traffic to Brooklyn. With Mr. Sprague, he believed that the lower west side of Manhattan had been neglected by the tri-borough plan. Experience had shown that the duplication of transit facilities does not increase the value of real estate as much as does the building of a line in virgin city territory. Thus the tri-borough route not only would have to compete with an existing system, but incidentally it would deprive the city of increased income from taxation on improved real estate. The subways ought to be spread out, not segregated in a narrow strip on the east side of Manhattan Island. The Pennsylvania Railroad terminal under the present plan was absolutely isolated from the rest of the city's rapid transit system. Mr. Wilgus submitted a modified tri-borough route similar to the one proposed by Mr Sprague, except for a Forty-second Street cross-connection, a track connection at Canal Street and some minor changes The cross-section of the proposed subway, although costing 30 per cent more, due to its greater size, really would not accommodate steam railroad cars while unnecessarily large for the standard subway cars. This fact was shown by a study of the roof and platform clearances. Improved ventilation could be obtained for much less expense than by building an extra large section. He did not see why there should be an extra expenditure of $37,000,000 for this purpose when there was such a crying need for rapid transit in other sections of the city. Modifications were still possible in the uncompleted sections, and if carried out would save $35,000,000 to $40,000,000.

L. B. Stillwell, consulting engineer, New York, said that nothing was more important than to have a question of this kind discussed by engineers speaking as public-spirited citizens. There was no reason why they should sit on the fence to see these problems settled by real estate men and newspaper reporters. He indorsed the technical criticisms of Messrs. Sprague and Wilgus, saying that the tri-borough route was manifestly faulty and stupid in the points brought out by them. It ought to be integral with the Interborough system or obviously compete with that system. Regarding ventilation, it had been assumed that partitions between tracks would improve ventilation, but no conclusive tests had ever been made on that point. He thought it absurd also that this tunnel should be laid out at much greater expense simply to accommodate foreign cars. Local traffic schedules should never be interfered with by outside trains. It would certainly be unwise to decrease the earning power of the subway for such a purpose. It seemed to be the fashion nowadays to build subways on what might be termed the A B C system. "A" dug a hole in the ground on the basis of cost plus 15 per cent; "B" then equipped that hole with tracks, cars, etc., also at cost plus 15 per cent; and then for three or four years the city would have to defer the evil day when it would have to make a contract with "C," who would offer 1 per cent instead of 5 per cent for the operation of that hole. In conclusion, Mr. Stillwell said that the first level of Broadway should be reserved for a moving platform, as that system offered the best medium for distributing the largest number of people at short intervals, while the adjoining streets should be used for high-speed through lines.

W. S. Murray, electrical engineer, New York, New Haven & Hartford Railroad, agreed with the preceding speakers except that he was inclined to favor a larger subway section because of the convenience that would be afforded to commuters who could go directly to their places of business in the city without change of cars. It seemed to him also a most unwise arrangement to place an alien line in the city, that is, one which could not be combined in the general plan of the present underground tracks throughout Manhattan.

Robert E. Dowling, president City Investing Company, New York, favored the Seventh Avenue route from Forty-second Street south, as suggested by Mr. Sprague. He disagreed with Mr. Murray about the great desirability of having commuters come into the city without change of cars. Speaking from a New York taxpayer's standpoint, he did not see why the city should spend $30,000,000 more than necessary simply to save a transfer to non-taxpaying commuters. A wider subway would cause much greater inconvenience to property owners along the line and would eventually cost the city a great deal of extra money.

C. K. Thompson, New York, said that the expense of operating the subway below the water line would be very great and also a burden on adjoining property. As to the profile of the subway, with its severe physical conditions, he said that it seemed to be in line with a general impression that a subway without grades or curves was no good.

The meeting closed with a few brief remarks from Mr. Sprague in which he expressed his satisfaction with the reception accorded to his paper.

CHAIRMAN WILLCOX'S COMMENTS ON THE DISCUSSION

When William L. Willcox, chairman of the Public Service Commission, First District, had his attention called to the paper read by Mr. Sprague and the ensuing discussion thereon, he gave out the following statement:

"Before commencing to advertise for bidders the commission gave several public hearings on the various features of the tri-borough system. The commission would have been very glad

to have had Mr. Sprague, Mr. Wilgus, and the other gentlemen appear at those hearings to express their opinions. In view of the fact that they did not choose to appear at those hearings, it is unfortunate that they did not withhold their remarks until after the bids were in, and then, if they had any criticisms to make, to appear before the commission on the question of whether or not the bids should be accepted. A delay of a few days would have made little difference, unless it was deemed important by them to discourage bidders in advance of the closing of bids."

It is stated with respect to the criticism that the tri-borough subway would be too large for the present subway equipment and too small for standard steam railway cars, that it would accommodate the cars used in suburban service on the Pennsylvania, Long Island, New York Central and New Haven Railroads. The clearances are too small only for Pullman cars and other extra heavy equipment. It was never intended that cars of the latter type should be run through the tri-borough subway; the increase in size was proposed simply to permit suburban cars to enter the city.

McCALL FERRY PLANT BEGINS OPERATION

The large hydroelectric plant which the Pennsylvania Water & Power Company has been building for a number of years at Holtwood, Pa., better known as McCall Ferry, was placed in operation on Oct. 14 and electrical energy was transmitted over its lines to Baltimore, Md. At present two wheels are in operation and all of the energy is being transmitted to the Consolidated Gas, Electric Light & Power Company, of Baltimore. The United Railways & Electric Company of Baltimore is also expected to use some of this power but as yet no contract has been made.

The hydroelectric development of the Pennsylvania Water & Power Company is located on the Susquehanna River about 10 miles northwest of the boundary line between Pennsylvania and Maryland, and about 20 miles from the tidewater of Chesapeake Bay. The dam across the river is approximately half a mile in length and is said to be the second longest dam in the world. It is built of solid concrete with an average height of 55 ft. and a width at the base of 65 ft. The downstream face is provided with the usual curve, and to allow for expansion and contraction layers of compressible material are introduced at intervals of 40 ft.

The power house, which is also built of solid concrete and connects the eastern end of the dam to the shore, is 500 ft. long. Provision is made for 10 units, with a total maximum rating of 135,000 hp. Elaborate precautions have been taken to guard against ice. The normal flow of the Susquehanna River is westward, thus carrying most of the ice away from the power house. In addition a wing dam, having three submerged arches through which the water enters the forebay, is built at right angles to the main dam, between which and a rock fill above floating booms are provided so as to divert such ice as is carried to the east over the spillway. Any ice which enters the forebay despite these safeguards, as well as ice which may form there, is diverted through three ice chutes built into the power house.

The water wheels are of the vertical type, each capable of developing 13,500 hp when operated at 53 ft. head and with 80 per cent gate opening. Two wheels are mounted on a single shaft of forged steel, and the entire weight is carried on a roller bearing supported by a casting set into the masonry. The arrangement for operating the gates consists of a vertical shaft made of pipe carried on a step and held at the top by a bearing attached to the wall. The maximum velocity of flow of the concrete openings is 6 ft. per second, and all changes of direction of flow have been made as gradual as possible so as to conserve the head. The draft tubes of the upper and lower wheels come out together below the level of the standing tail water, so that it is possible to get at the upper turbine by closing the head gates. When the lower turbine requires attention, stop logs may be used to cut off the tail race and the draft tubes drained by electric pumps. The water wheels were built by the I. P. Morris Company, of Philadelphia. Each wheel is coupled to a 7500-kw, three-phase, 25-cycle General Electric generator operating at 94 r.p.m.

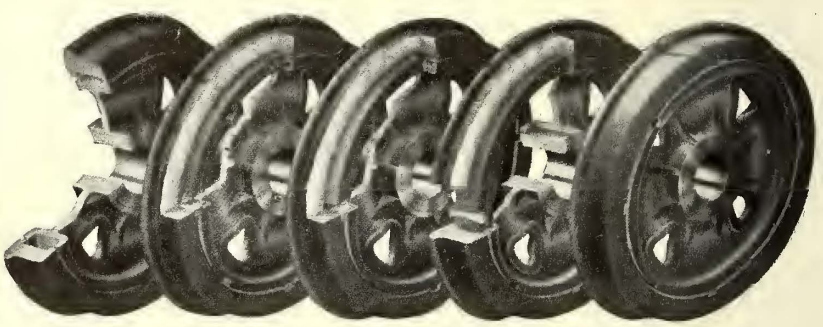
The hydraulic plant is now completed for an initial installation of 50,000 hp and an ultimate installation of 100,000 hp. The power house, gate house and transformer house are finished for six units, including rheostat and switchboard galleries, compartments for transformers and other apparatus. At the head works foundations, etc., are completed, the only work required to prepare the power house for the full installation of 100,000 hp being the completion of the superstructure.

Transmission line No. 1 is complete and ready for service. There are 500 steel towers, ranging in height from 40 ft. to 60 ft., carrying two 70,000-volt circuits each of three aluminum cables. The company owns title to a right-of-way 100 ft. wide and 40 miles long, extending from the Susquehanna River to the city of Baltimore, and a private telephone line is installed the entire length of the transmission system. The substation at Baltimore has been ready for operation for several weeks, and the transformer and auxiliary apparatus installed is sufficient to handle 40,000 hp. The equipment in the Baltimore substation was supplied by the Westinghouse Electric & Manufacturing Company.

The contractor for the installation was the Empire Engineering Corporation, which worked under the supervision of John A. Walls, chief engineer of the Pennsylvania Water & Power Company.

NEW STEEL-TIRED WHEEL

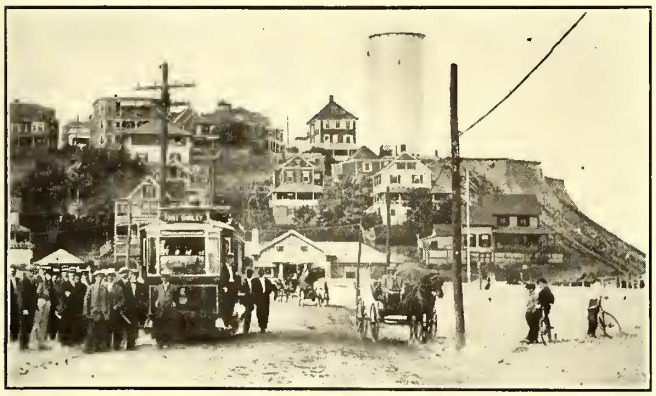
The new McConway steel-tired wheel made by the McConway & Torley Company, shown in the accompanying cut, embodies novel ideas in the manufacture of wheels of the built-up type. It has a rolled-steel tire and a cast-steel center with a cast-iron hub. The peripheral face of the wheel center and the inner circumference of the tire form an annular space divided into eight segments. This division is effected by the spacing wedges used for the temporary union of the tire to the center in the assembling of the wheel preparatory to casting therein the permanent locking. The locking wedges are in pairs, with points opposed, and when the metal has cooled the temporary spacing wedges are removed; the locking wedges are then driven home and intimate contact is obtained. This operation closes the space—or practically so—between the points of each pair of permanent locking wedges and doubles the space between the butts. At these enlarged spaces are the "sprag" notches in the inner flanges of the tire into which steel sprags or billets are fitted; thereupon the final closers are cast in place, so completing the circle of locking wedges which are under practically the same compression as if the tire were shrunk. As the sprags are embedded in the circle of cast-iron wedges and engage the tire through the notches in the flanges, they prevent the tire from turning on the hub.



Different Stages in the Make-up of the McConway Wheel

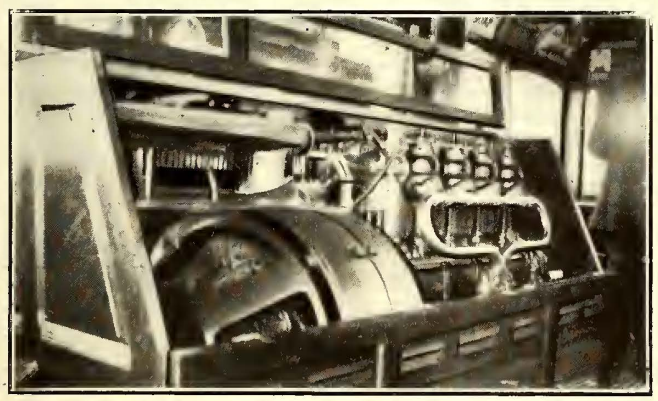
GASOLINE-ELECTRIC CAR WITH NOVEL CONTROL

Point Shirley, Mass., is a community with about 1000 people located about 1½ miles from Winthrop, which has a population of over 50,000. Both places are along Winthrop Beach, which



Trial Trip of Gasoline-Electric Car at Winthrop Beach

is a popular resort with Bostonians. When Point Shirley was the center of activities at Winthrop Beach a horse car line connected it with Central Square, East Boston. Later a steam railway known as the Winthrop Beach Shore Line extended its tracks to the Point, but the tracks were washed away in 1885 and were not replaced. During this year, however, the Point Shirley Street Railway Company was formed by Charles Ridgeway. The construction of the line between the Point and Winthrop was begun in August and completed in 14 days.



Engine and Generator at Side of Car

Owing to the great distance from a suitable power station it was impracticable to use ordinary electric cars. As a result, Herbert Ridgeway, treasurer of the company, designed the gasoline-electric car hereinafter described and illustrated.

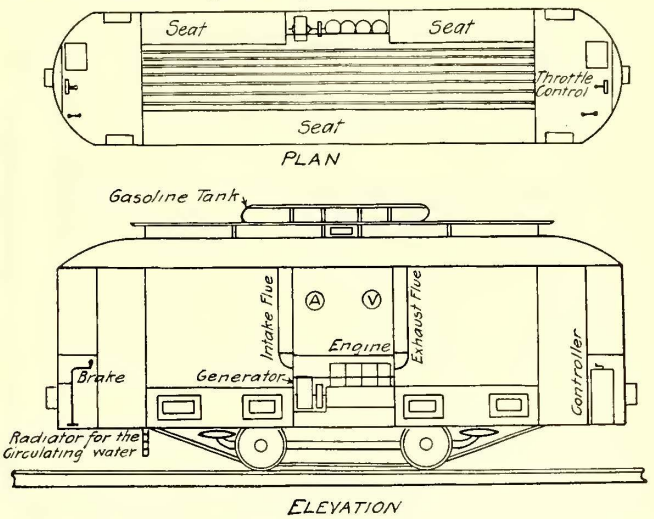
The car body is similar to the surface cars of the Boston Elevated Railway Company. It is 30 ft. long over all and is carried on a single truck having a wheelbase of 6 ft. 6 in. It weighs 16,500 lb. complete with all apparatus. The accompanying plan and elevation of the car show the arrangement of the seating and the machinery. It will be observed that one side of the car has a continuous longitudinal seat, but that the other side is broken up in the center for the installation of a generator and engine instead of placing the latter under the car or at one end. This equipment takes up a space equivalent to five seats. The available seating capacity is 21.

The prime mover is a four-cylinder, four-cycle, 40-hp gasoline engine, built by Blount & Lovell, of Boston. This engine is directly connected to a 30-kw Westinghouse d.c. compound-wound generator rated at 125 volts at 500 r.p.m. The motor is of the Westinghouse series type. The speed of the car is controlled by varying the impressed voltage. This is done through altering the engine speed by keeping the spark advanced and running on the throttle. By this method of control resistance losses are eliminated and the controller is reduced simply to a two-way switch for reversing the car. The speed may be varied from ½ m.p.h. to 25 m.p.h. An ammeter and voltmeter are mounted over the engine.

The car lighting is by the Apple system, in which a low-voltage d.c. generator is driven by the flywheel of the

Gasoline-Electric Car for Point Shirley

engine. This generator delivers energy to a storage battery which feeds 20-watt tungsten lamps. The Apple generator has an automatic cut-out to take it out of circuit when the engine stops running or when the battery voltage is greater than that of the generator. The storage battery also supplements the Bosch low-tension ignition system.



Plan and Elevation of Car

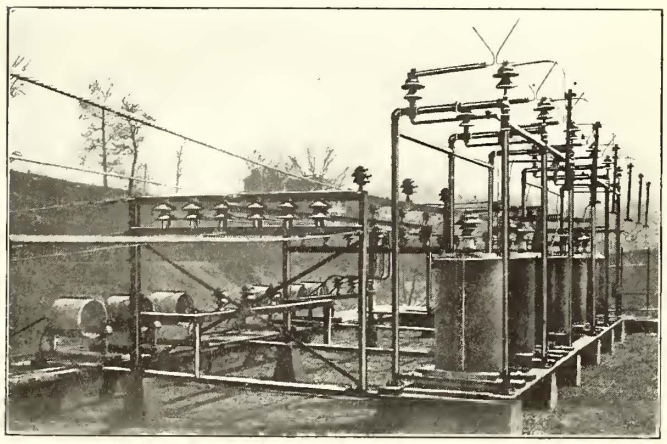
The gasoline tank is carried on the top of the car and is connected to the engine through two copper flues. One flue is used as an intake for the air to the carburetor and the other as an outlet to the muffler. A fan under the car, which draws the air through the radiator, is driven by a chain belt from the flywheel. In winter the hot gases from the exhaust will be used for heating the car.

The whole power outfit is encased in glass so that the passengers are not annoyed by flying grease. The vibration caused by the engine is so small as to be unnoticeable to the passengers and the exhaust also is perfectly muffled. During September the company carried 19,000 passengers in one power car and two trailers. A second power car is now under construction. At Point Shirley the company has built a combined car house and waiting room and a 500-gal. tank for storing gasoline.

A syndicate of capitalists has been granted a concession by the Peruvian Government to develop water-powers on the Chancay River and build an 80-mile electric railway connecting Ancon and Huacho. The address of the syndicate may be obtained from the Bureau of Manufactures, Washington, D. C.

ELECTROLYTIC LIGHTNING ARRESTERS

Many devices have been invented to protect electric equipment from abnormal voltage on the line. The most recent is the electrolytic lightning arrester, which depends upon the safety-valve action of a film on an aluminum plate. The Westinghouse type consists of nested aluminum trays filled with electrolyte and submerged in oil. The horn-gaps, which are between the arresters and the line, break down on over-voltage. If this voltage amounts to over approximately 330 volts per tray a free passage through the film from tray to tray and



Electrolytic Lightning Arresters

thence to the ground is provided. When the voltage drops to normal, which is below the critical voltage of the tray, the apparent resistance of the film reasserts itself and the flow of the current is cut down so that the horn-gaps disrupt the arc and all further flow of current ceases.

The nested trays are placed in oil-filled, welded-steel tanks, which for 22,000 volts and above are built with cast covers and outdoor terminals. The complete arrester consists of four tanks mounted on an insulated platform for ungrounded neutral service, and three tanks grounded for grounded neutral service. For 13,200 volts and under the arrester is arranged for indoor service only, as the horn-gap setting is so small that much more effective service is obtained when the arrester is housed.

Since, when the electrolytic type of arrester is allowed to stand without current passing through it, the film on the plates dissolves, it is necessary periodically to pass current through the arrester in order to keep the film in the best condition. This prevents an abnormal rush of current when the arrester discharges after long idleness. The rate of dissolution of the film depends upon the kind of electrolyte used and the temperature. There are two kinds of electrolyte made by the Westinghouse Electric & Manufacturing Company; one requires that the horns be bridged daily to pass current through the arresters, and the other requires that the horns be bridged only every seventh day. When arresters are bridged at normal voltage a bluish, crackling static arc indicates the normal condition of the arrester. If the arc is reddish and fluffy, and rises high on the horns, it is evident that the bridging of the horns has been deferred too long a time, and it will take a short period before the arc comes down to normal.

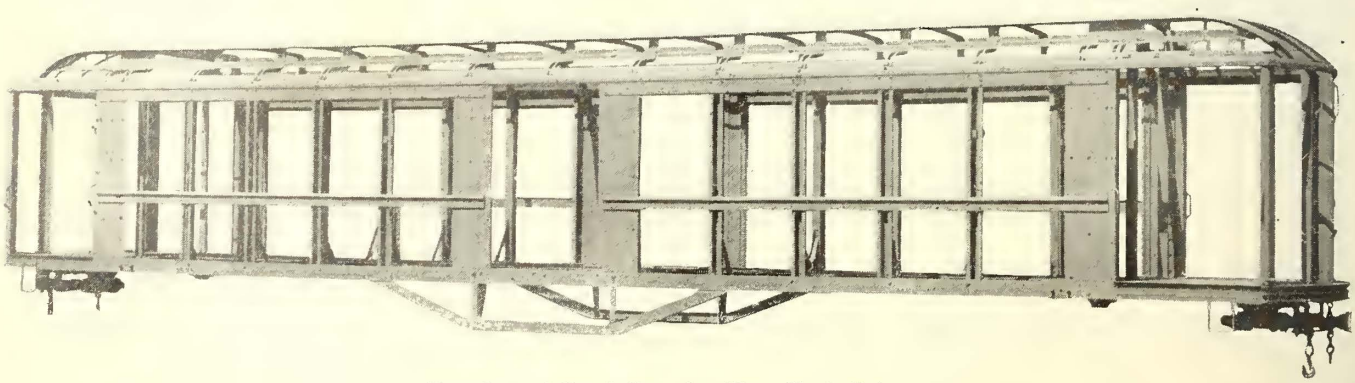
The horn-gaps and bridging device are mounted on a 2-in. pipe frame, to which is also attached the transfer switch used for interchanging a ground and phase tank on ungrounded neutral arresters. The bridging device is very simple and can be operated from either end.

As the voltage increases the trays in the arrester also increase. Hence, for a higher voltage, if the trays were all built in a continuous structure it would be very awkward to handle and require considerable overhead room when installed indoors. For this reason, on all arresters above 13,200 volts the tray structure is built up into sections containing not over 50 trays, which slide into place, one above the other, between guides supported by a base casting fitting closely the bottom of the tank. The electrolyte is poured into the trays with a measuring cup. When a section of trays is filled the electrolyte is plainly visible so that each tray can be checked. All parts of the supporting frame directly in contact with the trays are made of porcelain to prevent danger due to burning supports.

STEEL CARS FOR THE NEW YORK SUBWAY

The Pressed Steel Car Company at the present time is building at its shops in McKee's Rocks, Pa., 175 all-steel cars for the Interborough Rapid Transit Company's subway service. The general design of these cars was developed by the car equipment engineering department of the Interborough Rapid Transit Company. A complete description of the design, illustrated with drawings of the framing, was published in the Electric Railway Journal of June 18, 1910, but it is of interest to refer again briefly to the principal features in connection with the view of the skeleton framing which is reproduced herewith.

By a careful consideration of the functions of each member and proper distribution of the metal the weight of a complete car body without electrical equipment has been reduced to 28,540 lb. This is exceptionally low for a steel car 51 ft. long over platforms, seating 44 passengers, and intended for use in such severe service as is found in the New York subway. The use of Hedley anti-climber rolled sections for the platform end sills contributes largely to this low weight. It is interesting to note that all interior lining has been eliminated. Owing



Framing of Steel Cars for New York Subway

to the fact that doors 4 ft. 2 in. wide are provided in the center of each side the girder construction in the sides below the windows is dropped 26 in. below the door sills in the center. The center sills are 6-in. I-beams stiffened laterally by pressed steel diaphragms which also serve to support the corrugated floor sheets. These sheets are formed of No. 22 gage galvanized steel. In the aisle between the seat risers a layer of car Karbolith 1 1/16 in. thick is placed on the floor sheets and on top of this is a layer of Carborundum-Karbolith surfacer ¼ in. thick. Back of the seat risers the corrugated floor sheets are left bare. The seat frames are formed entirely

of light sheet steel pressed to the required shapes. The seat cushions and backs, which are upholstered with woven rattan, are being furnished by the Heywood Brothers & Wakefield Company.

The center side doors are operated pneumatically while the platform side doors are operated manually. All entrance and exit doors, which are of pressed steel, were made by the Forsyth Brothers Company. The cars are equipped with Westinghouse electro-pneumatic brakes and are mounted on Hedley cast-steel side frame trucks furnished by the American Locomotive Company.

ELECTRIC TRUCKS FOR THE SHORE LINE ELECTRIC RAILWAY AND SOUTHERN PACIFIC COMPANY

At the recent exhibit of the American Street & Interurban Railway Manufacturers' Association the Baldwin Locomotive Works exhibited the two motor trucks shown in the accompanying illustrations. These trucks are quite different in design and carrying capacity, as they are intended for street and electrified steam railway service respectively.

The truck for the Shore Line Electric Railway represents the latest development of the short wheel-base truck with outside-hung motors, as built by this company. This truck is designated as class 54-18 F2, indicating a design with 54-in. wheel base and a carrying capacity of 18,000 lb. on the center plate. The truck is intended for city passenger service, on a standard gage line, and can be used on curves of 35 ft. radius. The maximum speed is 35 m.p.h. The cars have a seating capacity of 40 passengers each.

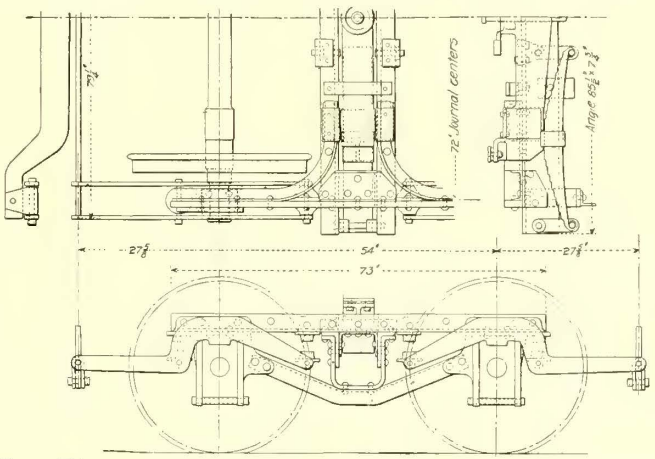
This truck has independent double equalizing beams mounted on each box, and the motors are suspended directly on these beams. The truck frame has two spring supports on each beam. With this arrangement not only is the truck frame relieved of strain due to the weight of the motors, but the motor reactions actually assist in supporting the frame; and the tendency to tilt the frame, when the motors are developing torque, is greatly reduced. Furthermore, the spring base is long so that the truck rides steadily when passing over uneven places in the track.

The new Shore Line trucks have forged iron side frames, 1¼ in. wide by 3½ in. deep. These frames are placed vertically, in which position they are best able to resist strains. Lateral stiffness is secured by 2½-in. x 3½-in. angles, which are riveted to the side frames and transoms. The latter consist of heavy angles. The truss members are composed of 3-in. x 3-in. angles and these are riveted to the pedestals. The structure of the truck thus consists chiefly of commercial sizes of iron and steel and is remarkably rigid and light. The angle iron braces uniting the side frames and transoms have sufficient stiffness to prevent "diamond pointing" even under severe service conditions.

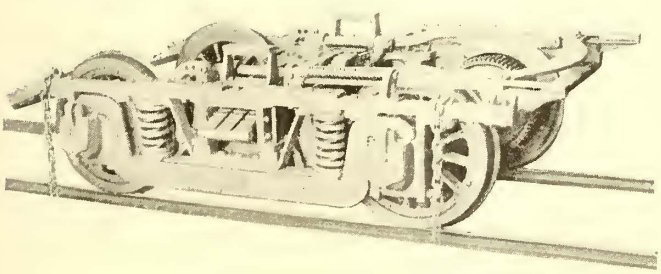
The truck bolster is of cast steel and is supported at each end on a half elliptic spring. These springs are suspended from the transoms by wrought-iron swing links. A satisfactory construction is thus secured without the use of a spring plank. The journals are 3¾ in x 7 in., designed in accordance with American Electric Railway Association standards. The wheels are 34 in. in diameter, of solid forged and rolled steel with rims 2½ in. thick. They were supplied by the Standard Steel Works Company. Each truck is propelled by two GE No. 216 motors.

The second truck is for the Alameda electrification of the Southern Pacific Company. It is one of an order for 130 motor and 120 trailer trucks, all of which are being built in accordance with drawings and specifications furnished by the railway company. The illustration shows one of the motor trucks. This design is of the equalized pedestal type with inside-hung motors and is suitable for a center-pin load of 35,000 lb. The track gage is standard and the truck wheel base 84 in. The operating conditions approximate those found in steam railroad service. The builders' class designation is 84-35 S.

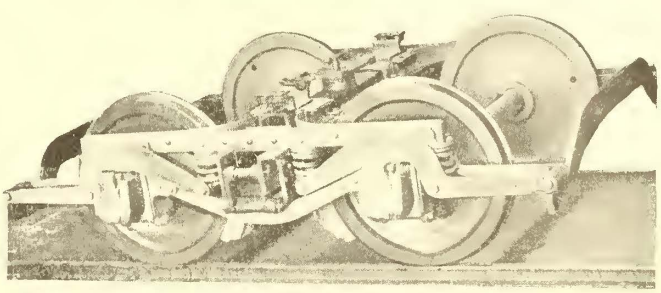
This truck has forged side frames and pedestals and channel iron end frames. The side frames are 2½ in. x 4 in. and are finished all over. The transoms consist of 10-in. channels, which are secured to the side frames by heavy cast-steel gussets. The equalizers are cut from steel boiler plate, the ends being punched while hot by means of a special die. The bolster is of cast steel. It is swing suspended and is supported at each end on a triple elliptic spring. The brakes are inside hung, the shoes being suspended from lugs cast on the transom gussets. The brake levers and shoe hangers are straight, without set, and the live levers are connected by suitable links with a radial transverse beam supported on cast-steel guides. The brakes are released by coil springs placed above the side frames. Each spring is slipped over a piece of 1½-in. pipe, which holds it in place and prevents chattering. The axles are of Taylor iron with 5-in. x 9-in. journals. The wheels are steel-tired with cast-steel centers. They were manufactured by the Standard Steel Works Company and were mounted hot under a specified wheel fit pressure. The diameter over the tires is 36½ in.



Part Plan and Side Elevation of Truck for Shore Line Electric Railway



Truck for Southern Pacific Railroad



Truck for Shore Line Electric Railway

The Baldwin Locomotive Works believe that for high-speed service conditions, such as are found on electrified steam lines, the equalized pedestal type of truck is in a class by itself, and is daily proving its superiority. The Southern Pacific design is of special interest because of the extent of the installation and the growing interest now being manifested in the electrification of steam railway terminals and suburban lines.

ELECTRIC RAILWAY LEGAL DECISIONS

LIABILITY FOR NEGLIGENCE.

Indiana.—Statutory Regulations—Violation—Negligence—Accidents to Trains.

In an action against a railroad for injuries to a motorman of an electric car received in a collision with a passenger train at the crossing of a railroad track, a complaint which alleged that the railroad negligently failed to bring the train to a stop before entering on the crossing, and without first ascertaining that there was no car approaching and about to cross, that, on the contrary, the railroad ran its train at full speed across the crossing, while the car was approaching in full sight and about to cross, stated a cause of action as against a demurrer under Acts 1905, c. 169, making it an offense for an engineer to run his locomotive across the tracks of any other railroad without first coming to a stop, etc.

Where the injury to a motorman operating cars across the tracks of a railroad, sustained in a collision between his car and a train at a crossing, was the result of the negligence of the railroad and an accident for which neither the railroad nor the motorman was responsible, the railroad was not liable unless the injury would not have happened had it not been negligent. (Louisville & Nashville Ry. & Lighting Co. et al. v. Hynes, 91 N. E. Rep., 962.)

Kansas.—Master and Servant—Injury to Servant—Negligence of Master.

In an action for personal injuries received by one of the crew of an electric car which had been derailed, while he was picking up the tools that had been used in replacing it, by being struck by another car, held, that the evidence justified a recovery on the theory that the plaintiff was injured while engaged in work requiring his presence upon the track under such circumstances that he was not under an absolute duty to keep an outlook, and that the motorman of the approaching car, in view of what he saw, could have anticipated that some one might be in a place of danger, and ought to have stopped or sounded a warning. (Ray v. Kansas City-Western Ry. Co., 109 Pacific Rep., 172.)

Kentucky.—Care Required in Operation—Contributory Negligence.

Where a person familiar with city streets, in passing a street car as it was turning a street corner, failed to make sufficient allowance for the swinging of the car, and in turning, the rear end struck his wagon, causing his injury, he was guilty of negligence precluding a recovery. (Louisville Ry. Co. v. Ray, 124 S. W. Rep., 313.)

Kentucky.—Competency of Motorman.

In an action against a street railroad company for injuries in a collision with plaintiff's carriage, there was evidence that the motorman served an apprenticeship of 15 days before being given a car, that he had served as motorman for about four and one-half months, and there was no evidence tending to show that this length of service did not qualify him to perform the duties of motorman, and the only evidence tending to show incompetency was evidence that he might have been negligent on the occasion of the accident. Held, that this evidence was not sufficient to show incompetency, and that the court did not err in refusing to submit to the jury the question of the motorman's incompetency. (Doll v. Louisville Ry. Co., 128 S. W. Rep., 344.)

Massachusetts.—Contributory Negligence—Acts in Emergency.

Where a female passenger reasonably anticipated injury from an explosion in an electric car, accompanied by a slight outburst of flame, she was not chargeable with contributory negligence in unnecessarily attempting to escape the danger, though it appears that if she had remained in her seat all danger would have been avoided. (Steverman v. Boston Elevated Ry. Co., 91 N. E. Rep., 919.)

Massachusetts.—Operation of Cars—Rights in Highway—Collision with Car—Questions for Jury—Negligence—Contributory Negligence.

A street railway company is not entitled to the exclusive enjoyment of a portion of the highway where its rails are laid, but the rest of the traveling public may also go on it without unreasonably interfering with its cars, though the latter are entitled to a certain preference by reason of their inability to turn out.

On learning of the approach of a car, other travelers should leave the rails at once if reasonably practicable; but travelers in the vehicles need not be constantly watching for the approach of a car from behind, and may reasonably assume under ordinary conditions that its driver will exercise common prudence to avoid a collision with others exercising their rights as travelers with ordinary care.

In an action against a street railway company, it appeared that plaintiff was driving a heavy wagon after dark in a broad street, and that a portion of the way outside of tracks was covered with ice and snow, and the footing for his horses was better between the rails, where there was no ice, and where he had been driving at a walk for about five minutes, when a car going in the same direction ran into him and caused the injuries for which he sued. Held, that plaintiff's due care and defendant's negligence were questions for the jury. (Callahan v. Boston Elevated Ry. Co., 91 N. E. Rep., 388.)

Massachusetts.—Management of Cars—Injuries to Travelers—Speed at Crossings—Street Railroads—Operation—Injuries to Person on Track—Questions for Jury.

The demand for rapid transportation by street railway companies does not relieve them from compliance with the law of the road, subject only to the modifications that the path of the car is fixed, while travelers, either on foot or in vehicles, may use the entire way, so far as it has been fitted and opened for public travel.

The rule that where a highway crosses a steam railroad at grade a traveler who neglects either to look or listen for approaching trains before crossing, but passes on and is injured, cannot recover does not apply in favor of street railroads.

A street railroad is required to regulate the speed of a car, and, if necessary, to sound the gong, that travelers using due care while passing upon the track from intersecting driveways or streets may not be imperiled by collisions.

Evidence that plaintiff, driving toward a street railroad, some distance before he reached the track, could see 300 ft. up the track, and see that there were no cars approaching, but as he approached nearer his view was obstructed, justified the jury in finding that to again look and listen, where he knew that any further observation would have been prevented till he arrived so near the track that he could not turn back, was uncalled for.

Whether plaintiff, driving toward a street car track, having observed the track some time before he reached it, at a distance of 300 ft. from the crossing, properly acted on his judgment that if a car came at the usual rate of speed he had ample time to go over, or whether he should have stopped, alighted, and ascertained before attempting to cross if a car was coming, were questions of fact, and not of law. (Horsman v. Brockton & P. St. Ry. Co.; Davis v. Same, 91 N. E. Rep., 897.)

Michigan.—Injury to Passenger—Inference of Negligence—Burden of Proof.

There is an inference of negligence, requiring no further proof, but open to rebuttal, where an electric car containing passengers, and under the control of the carrier's servants, continues its course till it collides with a standing car ahead of it, with such force as to push such car ahead 75 feet.

Plaintiff's burden of proof as to negligence of defendant, in an action by a passenger against a carrier for injury from collision of cars, does not shift, even where a presumption of negligence exists from the collision; but the presumption is to be weighed with defendant's evidence, and if as a whole the evidence does not preponderate for plaintiff, he cannot recover. (Sewell v. Detroit United Ry., 123 N. W. Rep., 2.)

Michigan.—Injuries to Street Sweeper—Contributory Negligence—Negligence After Accident—Discovered Peril.

Where, notwithstanding the noise in the street from passing vehicles, etc., plaintiff, a street sweeper, worked on the track of a street railway in such position that he could not see cars approaching him from the rear, and relied solely on his sense of hearing for safety, he was guilty of negligence precluding a recovery for injuries sustained in a collision with a car approaching from that direction.

Where a street railway motorman, as he was about to strike plaintiff, a street sweeper, reversed the motor to make a quicker stop, and the car, after striking plaintiff, moved forward for some distance, and then stopped and began to move backward because the motor was still reversed, without any intervening act on the part of the motorman, plaintiff could not recover under the doctrine of discovered peril for injuries sustained by being rolled backward while under the fender on the theory that defendant's motorman was negligent in backing the car after plaintiff was struck. (Stenzhorn v. City Electric Ry. Co., 123 N. W. Rep., 621.)

Michigan.—Carriage of Passengers—Street Railroads—Care Required—Taking On or Letting Out Passengers—Duty to Stop Car—Injury to Passenger—Negligence of Conductor.

The degree of care required of carriers of passengers upon street cars in securing the safety of passengers entering or alighting is the highest care or the care which a very prudent person would have used under the circumstances.

It is the duty of a street car company to stop to take on or let off passengers, the time of stoppage being such as to enable the passenger to reach a place of safety, either on the street or in the car before it is started, and the company is liable for injuries to a passenger caused by a disregard of that duty.

A street car stopped for the sole purpose of taking plaintiff as a passenger. He was encumbered with a heavy grip, and there was snow on the ground and car steps. The conductor was standing on the rear platform waiting for plaintiff to get on. Plaintiff had his grip in his right hand, and had hold of the railing with his left hand. When he had either one or both feet on the first car step, and before he had time to reach the platform, the conductor started the car, and he was thrown to the ground. It did not appear that his fall was caused by anything except the starting of the car. Held, that the conductor was negligent as a matter of law. (Beattie v. Detroit United Ry., 122 N. W. Rep., 557.)

Missouri.—Duty of Motorman—Precautions as to Vehicle on Track—Duty to Use Light at Night.

The motorman of a street car must use ordinary care to discover persons or vehicles on the track, and in a populous section of the city cannot expect a clear track, and, if he discovers a vehicle on the track, he should give notice so as to afford the driver an opportunity to get off the track, and if such driver does not do so, and it becomes apparent to the motorman that he does not intend to get off, it is the motorman's duty to stop the car rather than run into and injure him, and the car should be kept under control so that it may be so stopped.

A street railway company must keep lights on its cars at night to enable its motormen to see ahead a sufficient distance to discover persons on the track. (Clover v. Joplin & P. Ry. Co., 124 S. W. Rep., 43.)

Missouri.—Collision of Car with Boy—Negligence—Evidence—Humanitarian Doctrine.

Evidence in an action for collision of a street car with a boy six years old, who in front of a schoolhouse, at the hour of dismissing school, ran diagonally across the street in front of the car, with his back partly turned toward it, held sufficient to show that he was in a position of peril, which the motorman saw, or by the exercise of reasonable care should have seen, in time to have avoided striking him, with consequent liability of the railroad company under the humanitarian doctrine. (Edwards et. al. v. Metropolitan Street Ry. Co., 127 S. W. Rep., 605.)

Missouri.—Broken Trolley Wire—Injuries to Pedestrians—Care Required—Damages—Excessiveness.

Where a broken trolley wire carrying a current of electricity fell into a public street and struck and injured a pedestrian, while under the control and management of defendant street car company, such facts were sufficient to raise a presumption of negligence, and to cast the burden on defendant to show that the wire was on the street without fault of its servants or agents.

Where, in an action for injuries to a pedestrian by a broken trolley wire that fell into the street, the petition, evidence, and instructions did not proceed on the doctrine of res ipsa loquitur, an instruction that if the wire charged with a deadly current of electricity was negligently permitted by defendant to break in two, and if defendant negligently permitted the wire to become old and worn by continued use to the extent of impairing and weakening its tensile strength so that it became inadequate for use, and by reason of such defective condition it was negligently permitted to break, was not objectionable as authorizing a finding of negligence from the mere breaking of the wire.

A railroad company must use the utmost care of an ordinarily prudent person engaged in the same line of business to maintain its overhead trolley wires in a safe condition.

Plaintiff, while standing at a street corner, was struck and injured by a heavily charged trolley wire which broke as the car approached. Prior to the accident plaintiff was a strong, able-bodied man. After the accident his face showed that he had received a charge of electricity. His injuries were so severe that he remained unconscious for 10 or 12 days; his lip was cut to the teeth and he had a white line resembling an electric burn from car to ear; his eyesight and hearing were affected; his hair turned gray, and from November 20 to March 23 he had aged to to 15 years. He was unable after the accident to perform any kind of manual labor, and was a wreck physically and mentally. Held, that a verdict for $9,500, from which plaintiff remitted $2,000, was not so excessive as to show that it was the result of passion and prejudice. (Booker v. Southwest Missouri R. Co., 128 S. W. Rep., 1012.)

Missouri.—Carriage of Passengers—Care Required—Passengers—Contributory Negligence—Regulation—Ordinances—Validity.

A carrier of passengers is not an insurer, but must exercise the utmost care and diligence of a cautious person so as to safely tranport them, and it must allow reasonable time for passengers to enter and leave its cars with safety in the exercise of ordinary care.

A passenger attempting to board or alight from a moving train is generally guilty of contributory negligence, precluding a recovery for the injuries received, though the carrier was guilty in the first place in not stopping its train a reasonable time for the passenger to enter or leave it in safety, subject to some exceptions where the car is moving so slowly that the passenger's act may not be contributory negligence as a matter of law.

An ordinance regulating street railways by providing that conductors shall not allow women or children to leave or enter the cars when the same are in motion is valid.

An ordinance regulating street railways by providing that conductors shall not allow women or children to leave or enter cars while in motion modifies the common-law rule of negligence of carriers and contributory negligence of passengers, and a street car conductor who permitted a female passenger to attempt to alight while the car was in motion was negligent, for which the street railroad was liable, unless the passenger was guilty of contributory negligence in leaving the car under the circumstances. (Johnson v. St. Joseph Ry., Light, Heat & Power Co., 128 S. W. Rep., 243.)

New York.—Street Railroads—Injury to Person on Track—Negligence.

Where a person seeing a rapidly approaching street car signaled it to stop and then attempted to cross the street in front of it, to board it on the other side of the street, as was necessary, and was struck and killed, he was negligent, precluding a recovery. (Flynn v. Joline et al., 119 N. Y. Sup., 785.)

New York.—Imputed Negligence—Negligence of Parent.

It is not, as a matter of law, negligence for a mother of a child, 3½ years old, to permit the child, accompanying her to a store on the opposite side of the street, to leave the store and start across a street on which cars are operated while she is waiting for her change for a toy bought for the child; but the question is for the jury. (Zwirn v. Joline et al., 122 N. Y. Sup., 231.)

New York.—Collision with Automobile—Evidence of Negligence.

Negligence on the part of receivers operating a street railroad cannot be inferred from the mere fact that a street car came into collision with an automobile. (Moore v. Joline et al., 123 N. Y. Suppl., 117.)

New York.—Operation of Cars—Care Required—Obligation of Pedestrians.

A motorman operating a car in the usual direction must keep a close lookout and take prompt measures to avoid endangering travelers and to extricate them from any peril, and a motorman operating a car in the opposite direction must proceed cautiously, give frequent warnings, and, until the contrary appears, assume that a pedestrian on the tracks is not aware of the approach of the car from such direction, and a motorman operating such a car at a speed precluding a stop in less than 100 feet, while he could not see ahead more than 30 or 40 feet, was guilty of negligence.

It is not negligence per se for one late at night to leave the sidwealk because of the darkness cast over it by shade trees and use the car tracks, but he must keep a close lookout for cars without anticipating that cars will be run contrary to custom.

Whether a pedestrian struck by a street car while walking on the track was guilty of contributory negligence held, under the evidence, for the jury. (Shipley et al. v. Metropolitan St. Ry. Co., 128 S. W. Rep., 768.)

New York.—Injury to Person Attempting to Board Car—Contributory Negligence.

A person at night signaled a rapidly moving electric car to stop at a highway crossing. The car ran past the crossing and then stopped. He then started to run to catch the car, which commenced to back, and it ran against him. He had an unobstructed view of the lighted car, and he could have seen it had he looked. He knew that the car had a superior right of way beyond the crossing. He neither looked nor listened. Held, that he was guilty of contributory negligence as a matter of law, for he could not assume that the motorman would not do his duty and return the car to the crossing. (Engler v. International Ry. Co., 122 N. Y. Suppl., 841.)

Pennsylvania.—Collision with Vehicle—Question for Jury—Negligence of Motorman—Contributory Negligence.

Where the condition at a crossing where a collision between an electric car and a vehicle occurred was such that the motorman saw, or ought to have seen, the team when it crossed, at a distance great enough to have stopped his car and avoided the collision if the car had been under control, his failure to control his car calls for explanation, and the question of his negligence is for the jury, in view of whatever special or accidental feature of the time or place might excuse him.

Where decedent drove a four-horse team attached to a heavy oil wagon out of a private lane onto a public highway on a hill, and was struck by an electric car while crossing the second track of a double track railway on the highway, and it appeared that decedent stopped the team not more than eight feet from the first rail of the first track, and both he and his companion looked both ways and agreed that no car was in sight, and it appeared that they had a clear view of 560 feet to the top of the hill in the direction from which the car came, and that they were also in clear view of the motorman from such point, the questions of the motorman's negligence and decedent's contributory negligence are for the jury.

Decedent's negligence could be determined as matter of law only if the evidence were undisputed that in attempting to cross the tracks he drove in front of the approaching car when it was so close that the motorman could not reasonably have been expected to stop the car in time to prevent the collision.

The absence of a burning headlight, or failure to sound a gong or ring a bell on a car which collided with a team, is not material evidence of negligence of the railway company where it does not appear that the absence of such warnings contributed to the accident. (Mackey v. Philadelphia & West Chester Traction Co., 76 At. Rep., 201.)

Texas.—Contributory Negligence of Child.

In determining whether the question of a child's contributory negligence should be submitted to the jury in an action for personal injuries, the test is not whether reasonable men would agree that an ordinarily prudent child would have acted as plaintiff did, but whether they would differ on that question. (Citizens' Ry. Co. v. Robertson, 125 S. W. Rep., 343.)

Texas.—Instructions—Requests—Contributory Negligence.

Where, in an action for injuries to a street car passenger while alighting from a moving car, defendant proved that plaintiff stepped off the car with her back the way the car was going, a charge predicating contributory negligence on the fact that she alighted from the car while in motion covered the facts grouped in a requested charge that if she attempted to alight without following the motion of the car, and a person of ordinary care would not have so acted, she was guilty of contributory negligence, submitted the issues raised by the evidence.

To prove the contributory negligence of a street car passenger suing for injuries while alighting from a moving car, the burden is on defendant to prove not only that the passenger stepped off the car in motion, but that a person of ordinary prudence would not have so acted, and a charge that if the passenger stepped off the car while moving, not following its motion, she was guilty of negligence, unless a person of ordinary care would have done so, was properly refused because it required the passenger to show that a person of ordinary prudence would have acted as the passenger did to acquit her of contributory negligence. (Barnes v. Dallas Consol. Electric St. Ry. Co., 128 S. W. Rep., 367.)

Wisconsin.—Master and Servant—Safety of Place to Work and Appliances—Assumption of Risk—Infirmity of Fellow Workmen—Liability Therefor—"Vice Principal."

An employer must provide a reasonably safe place to work and reasonably safe appliances to work with, and he is liable for the proximate consequences to the servant from omission so to do.

An employee assumes the ordinary risks of the business which he knows, or, as an ordinary careful and intelligent man, ought to anticipate.

The likelihood of human infirmity in his fellow workmen is one of the risks assumed by an employee.

A master is not liable for negligence of a fellow servant in the common employment.

A distinct and independent employee to whom is delegated the duty to disconnect and make safe electric wires on which others must work is ordinarily a vice principal, and not a fellow servant with the linemen and other like workmen. (Massy v. Milwaukee Electric Ry. & Light Co., 126 N. W. Rep., 544.)

Wisconsin.—Alighting from Moving Car—Negligence.

While alighting from a moving street car does not, in all cases, constitute negligence as matter of law, yet an adult man of ordinary intelligence, laboring under no fright or excitement, and confronted with no exigency, who alights from a street car which to his knowledge is moving at the rate of six miles an hour is negligent. (Fosnes v. Duluth St. Ry. Co., 122 N. W. Rep., 1054.)

Wisconsin.—Action for Death—Negligence of Motorman—Failure to Show—Direction of Verdict—Duties of Motorman—Performance—Care Required.

Plaintiff's deceased, a laborer, was a passenger on a street car, carrying with him his shovel. He alighted from the car at the end of the line, and after going a short distance discovered that he had forgotten his shovel, and started back toward the car, which had started on its return trip. He boarded the moving car, walked rapidly past the conductor, through the car, shouted, "Stop, I want my shovel!" in Polish, stood in the vestibule with his back to the motorman, reached into the car for his shovel, when the motorman increased the speed of the car, and deceased fell off, sustaining injuries from which he died. Held, in an action against the street car company, that as the shovel had been left on the car by the negligence of deceased, in boarding the car he could demand nothing except that when the car reached its next regular stopping place he be let off, and as he was standing apparently in a safe place there could be no reasonable inference that any injury would happen to him merely by an ordinary increase in speed, and hence no negligence on the part of the motorman was proven, and a verdict was properly directed for defendant.

Great diligence is required of a motorman in the performance of his duties, which necessarily prevent him from keeping a close watch in his rear, since, when his car is moving, he must keep a close lookout ahead, so that he may be able to control his car immediately upon the appearance of danger to any one. (Bukowski v. Milwaukee Electric Ry. & Light Co., 125 N. W. Rep., 912.)

News of Electric Railways

Chicago Consolidated Traction Ordinance Passed

The City Council of Chicago has passed an ordinance permitting the rehabilitation of the principal lines of the Chicago Consolidated Traction Company and allowing the purchase of the property of the company as contemplated in the reorganization plan by the Chicago Railways at a valuation of $3,968,539 placed on the property by Bion J. Arnold. The city is to get 55 per cent of the net income of the company, the same proportion that it receives under the ordinances granted to the Chicago City Railway and the Chicago Railways. Briefly, the ordinance runs for 17 years, expiring simultaneously with the Chicago Railways franchise of 1907. Nothing therein is to be construed as being a grant to the Chicago Railways extending beyond Feb. 1, 1927, but the new ordinance is amendatory of, and supplemental to, the ordinance of Feb. 11, 1907. The purchases by the Chicago Railways include for use until rehabilitation is complete 128 miles of track, 172 cars, 3 power houses; the rest of the Consolidated Traction Company's 187 miles of track and 344 cars are either outside the city limits or must be abandoned. All rights of the city with respect to the purchase of the system of the Chicago Railways as provided in the ordinance of 1908 apply to the new ordinance. The 128 miles of track of the Chicago Consolidated Traction Company on the West and Northwest sides are to be reconstructed and maintained at the highest practical efficiency and in full accordance with the provisions of the Chicago Railways ordinance of Feb. 11, 1907. Reconstruction and rehabilitation are to be prosecuted under the direction of the board of supervising engineers, and with all due diligence and the cost thereof is to be determined, paid for and certified in accordance with the provisions of the ordinance of the Chicago Railways of 1907. Two hundred and fifteen new double-truck cars are to be placed in operation "at the earliest practicable moment." The Chicago Railways is to pave, repair, sweep, sprinkle and clear from snow the right of way and one foot on either side the outer rails. On single-track lines this space is to be at least 8 ft. wide and on double-track lines it is to be 16 ft. wide.

J. M. Roach, president and general manager of the Chicago Railways, is reported to have made the following statement in regard to the work to be carried out to the lines of the Chicago Consolidated Traction Company:

"We are now getting steel rails in orders of 20,000-ton lots and have enough ties on hand to lay three miles of track. Enough more have been ordered in advance so that they will be here before the present supply is used. These are the big things in street-car construction and inability to obtain them can cause an unavoidable delay. There will not be any wait on their account.

"Frost is the only thing that will stop us. It is impossible to lay concrete such as is required for the foundations of the tracks in frosty weather. We are planning now to keep working until Nov. 20, 1910. Usually we plan to stop Nov. 1, but this is an emergency which demands special effort. If the mild weather keeps up until late in the autumn we may work much longer and accomplish much more.

"The big trunk-line streets will be cared for at once as much as possible. The others and the extensions will be taken up next spring. Work on outlying streets is much faster. There is less traffic to interrupt, fewer pipes and wires underground and excavation is easier. In a few days we will start putting men at work and at least 3,000 will be employed. Work will go on as fast as possible. Little can be done at night to any advantage and we probably will not attempt it.

"We are now receiving cars on an order of 350. About 250 are still to come and will enable us to replace the small cars on the lines of the Consolidated Traction Company. The new cars are of the semi-steel type, seating 40 passengers, such as are now used on West Twelfth Street. In addition we have a large number of rebuilt cars, such as are on North Clark Street, numbered above 1100."

Columbus Strike Declared Off

The employees of the Columbus Railway & Light Company, Columbus, Ohio, who were on strike, have declared the strike off, according to a statement in the *Ohio State Journal*. The company has not granted the men any concessions, but the men, it is understood, expect the company to promise to take back as many men as there are positions vacant. The first vote to declare the strike off was taken on Oct. 15, 1910. The proposal was then defeated after much disorder and bickering by a vote reported to have been 181 to 34. More of the men than indicated by this vote, however, realized that the end of the strike was at hand, and they prevailed over the others at the subsequent meeting.

Two more convictions on the charge of throwing stones at cars during the strike have been secured and one man has been sentenced to a term of two years in the penitentiary on the same charge. So far, the prosecution has been successful in every case tried on this charge. Motions for new trials in both cases were denied. In one of the cases, however, time was given to prepare a plea for mercy, and on Oct. 14, 1910, the offender was sentenced to an indefinite term in the Mansfield reformatory and to pay a fine of $50.

On Oct. 14, 1910, Ernest Flynn was found guilty of throwing stones at cars at the corner of Leonard Avenue and Jefferson Avenue. He was among the first men arrested and the prosecution made a strong case against him because he attempted to escape by flight.

The depositions of James O'Ryan and Edward O'Ryan, brothers, in relation to the case of James H. Orr, were taken before Commissioner Armstrong on Oct. 13, 1910, because the men had arranged to go to Florida and could not be present at the trial. Orr was indicted on the charge of dynamiting a car on Main Street. The O'Ryan brothers, who live in a house adjoining that of the accused, testified that they were awakened by the explosion and heard Orr jump out of bed. They later found him on his porch to ascertain the cause of the noise. They said that he had slipped on his trousers over his pajamas and they were sure that he could not have been at the scene of the explosion. Orr is a member of the local union of street railway men.

George W. O'Leary, indicted as George W. Brady on the charge of firing shots that wounded two women and a girl during the riots, has filed, through his attorneys, eight affidavits sustaining his contention for a continuance of his case. Most of them relate to the fact that several of his witnesses, men who operated cars during the strike, cannot be found. He claims that he can produce witnesses to show that he did not carry any revolver and that the shots which hit the women came from behind a billboard in the neighborhood.

Meeting of Railway Commissioners.—A call has been issued for the twenty-second annual convention of the National Association of Railway Commissioners, to be held in the hearing room of the Interstate Commerce Commission, Washington, D. C., on Nov. 15, 1910.

Public Service Commission Exhibit.—A budget exhibit of the city of New York is being held at 330 Broadway, Manhattan, under the direction of the budgetary publicity committee of the board of estimate and apportionment. It includes an exhibit designed to show the work of the Public Service Commission for the First District.

Report on Earnings in Toledo Made Public.—Nau, Tanner & Rusk, Cleveland, Ohio, who were retained some time ago by the City Council of Toledo, Ohio, to report to the city regarding the receipts and expenditures of the Toledo Railways & Light Company for the last eight years, have filed their report with the city and it has been made public.

Municipal Railway Proposed for Los Angeles.—By resolution introduced by Councilman Gregory, the Council of Los Angeles has requested the Board of Public Works to

report the feasibility of and the most practicable route for the construction of a municipal railway from the business center of Greater Los Angeles to the harbor district at Wilmington and San Pedro.

Proposed Municipal Line in Toronto.—Before Dec. 31, 1910, Toronto will give notice of its intention to take over that portion of the Mimico branch of the Toronto & York Radial Railway which is within the city limits. The franchise to this part of the line expires on Dec. 31, 1911. The length of track is 1 1-10 miles. Application is to be made to the Legislature of Ontario at the coming session for power to assume possession of the Mimico line of the Toronto & York Radial Railway.

Nominations of the New York Railroad Club.—The nominating committee of the New York Railroad Club has submitted the following list of nominations for officers of the club during the ensuing year. For president, H. S. Hayward; for first vice-president, Frank Hedley; for second vice-president, W. J. Harahan; for third vice-president, Eugene Chamberlin; for treasurer, R. M. Dixon; for executive member (three years), George Wildin; for member finance committee (three years), Charles Shults. Under the rules of the club, ballots must be in before noon of Nov. 18, 1910.

Decision in the Peoria Water Case.—Judge Sanborn of the United States Circuit Court handed down a decision on Oct. 4, 1910, in the case of the Peoria Water Company versus the Peoria (Ill.) Railway Company. It is said that the decision grants the plaintiff an injunction against the railway company restricting the latter from so using its current as further to damage the mains and property of the Peoria Water Company by electrolysis, and that the Illinois Traction Company, which controls the Peoria Railway Company, will appeal the case to the Supreme Court. Previous references to this case have been published in the Electric Railway Journal of July 3, 1909, page 43; March 21, 1908, page 469; June 22, 1901, page 722, and June, 1899, page 390.

Boston Elevated Railway Files Plans for Sullivan Square Changes.—In connection with the construction of its elevated extension to Everett and Malden, the Boston (Mass.) Elevated Railway has petitioned the Massachusetts Railroad Commission to approve plans for the alteration of the Sullivan Square terminal station at Charlestown which will make it possible to handle the traffic expected when the line is completed. The company proposes to build a new loading platform on the west side of the present station building, and to separate in-bound from out-bound traffic by ramps and an overhead bridge, with suitable divisions which will confine loading of trains to one part of the station and unloading to another. A surface car loop will supersede the present stub tracks on the west surface platform of the station, and the tracks are to be arranged so that trains can be sent back to the city proper without going to Malden if desired, in a similar manner to the handling of trains at Dudley Street terminal in connection with the Forest Hills extension. The board will give a hearing upon the proposed changes.

Bids Wanted for Material for Invercargill.—The Invercargill Corporation Tramways, Invercargill, New Zealand, invites tenders for supplying the equipment for an electric railway in Invercargill, the contracts to be divided into the following sections: Contract No. 1, power house plant (erected complete); Contract No. 2, rails, fishplates and bolts, points and crossings, special work and bonds; Contract No. 3, car bodies; Contract No. 4, electric car equipment; Contract No. 5, car trucks; Contract No. 6, overhead material; Contract No. 7, wires and cables; Contract No. 8, steel poles; Contract No. 9, tower wagon; Contract No. 10, dog spikes; Contract No. 11, street lighting plant. Specifications may be obtained at the Town Hall, Invercargill, New Zealand, and from W. Coward & Company, 9 Finsbury Pavement, London, E. C.; Alfred Dickenson & Company, Central House, New Street, Birmingham, and Gresham House, Old Broad Street, London, E. C.; R. W. Cameron & Company, 23 So. William Street, New York; R. W. Hunt & Company, 1121 The Rookery, Chicago, Ill. One pound must be deposited for a copy of each section of the specifications. This deposit will be returned on the receipt of a bona fide tender. Tenders close in Invercargill at 4 p. m. on Jan. 9, 1911. Scott Symington is tramway engineer at Invercargill.

Financial and Corporate

New York Stock and Money Market

Oct. 18, 1910.

The general tone of the stock market has improved to such a marked degree within the past fortnight that at the present writing there is a sentiment of optimisim that looks forward to normal business after election. Within the period mentioned prices have materially advanced and the volume of business has more than doubled. Interborough-Metropolitan, the leading traction issue, continues to be active at slightly advanced prices.

The money market has stiffened up a bit, but there is still an abundance of funds in the banks and rates are not excessive. Quotations to-day were: Call, 3 to 3½ per cent; 90 days, 4¾ to 5 per cent.

Other Markets

In the Philadelphia market there continued to be considerable activity during the week in Rapid Transit shares, but prices have advanced only fractionally with liberal profit taking by small holders.

In the Chicago market the certificates of the Chicago Railways have been traded in freely during the week, especially Series 2, at an advance, with several points advance in Series 1. There has also been some trading in Metropolitan Elevated preferred at advancing figures.

In Boston, Massachusetts Electric issues, especially the preferred, have been quite active. Prices for both issues have advanced. There has also been some trading in Boston Elevated.

There has been practically no trading in traction shares in the Baltimore market during the week. The bonds of the United Railways continue active at former figures.

Quotations of various traction securities as compared with last week follow:

	Oct. 13	Oct. 18.
American Railways Company	a43¼	a43¼
Aurora, Elgin & Chicago Railroad (common)	33	a48
Aurora, Elgin & Chicago Railroad (preferred)	a89	87
Boston Elevated Railway	128½	128½
Boston & Suburban Electric Companies	14¼	14¼
Boston & Suburban Electric Companies (preferred)	72	72
Boston & Worcester Electric Companies (common)	a10½	*10½
Boston & Worcester Electric Companies (preferred)	36½	36½
Brooklyn Rapid Transit Company	77⅝	79
Brooklyn Rapid Transit Company, 1st pref. conv. 4s	83¾	84½
Capital Traction Company, Washington	129	*129
Chicago City Railway	*102¾	102½
Chicago & Oak Park Elevated Railroad (common)	*3¼	*3¼
Chicago & Oak Park Elevated Railroad (preferred)	*7¼	*7¼
Chicago Railways, ptcptg., ctf. 1	a75	a75
Chicago Railways, ptcptg., ctf. 2	a18⅜	a19¾
Chicago Railways, ptcptg., 3	a9	a10
Chicago Railways, ptcptg., ctf. 4	a5	a6
Cleveland Railway	91½	*91½
Consolidated Traction of New Jersey	a73	a73
Consolidated Traction of N. J., 5 per cent bonds	a104	a104
Detroit United Railways	*45	*45
General Electric Company	153¾	155½
Georgia Railway & Electric Company (common)	a118½	a120½
Georgia Railway & Electric Company (preferred)	88	87
Interborough-Metropolitan Company (common)	20¾	22⅝
Interborough-Metropolitan Company (preferred)	57	58⅜
Interborough-Metropolitan Company (4½s)	81	81¼
Kansas City Railway & Light Company (common)	23½	a23½
Kansas City Railway & Light Company (preferred)	80	a80
Manhattan Railway	143	143
Massachusetts Electric Company (common)	a19⅞	a20½
Massachusetts Electric Companies (preferred)	a84	a85
Metropolitan West Side, Chicago (common)	a20	a23
Metropolitan West Side, Chicago (preferred)	a70	a70
Metropolitan Street Railway	*15	*15
Milwaukee Electric Railway & Light (preferred)	*110	*110
North American Company	69⅜	67½
Northwestern Elevated Railroad (common)	a20	*20
Northwestern Elevated Railroad (preferred)	a43½	a43¼
Philadelphia Company, Pittsburg (common)	a46¾	a46½
Philadelphia Company, Pittsburg (preferred)	a43½	a43
Philadelphia Rapid Transit Company	a19	a19¼
Philadelphia Traction Company	82	82
Public Service Corporation 5 per cent col. notes	a95	a94½
Public Service Corporation, ctfs	a100½	a101
Seattle Electric Company (common)	*109	*109
Seattle Electric Company (preferred)	*98½	*98½
South Side Elevated Railroad (Chicago)	a58	58
Third Avenue Railroad, New York	10¼	10⅛
Toledo Railways & Light Company	8¼	8¼
Twin City Rapid Transit, Minneapolis (common)	112½	112½
Union Traction Company, Philadelphia	a43½	a43¼
United Rys. & Electric Company, Baltimore	*14⅝	*14⅝
United Rys. Inv. Co. (common)	*15	*15
United Rys. Inv. Co. (preferred)	57	60
Washington Ry. & Electric Company (common)	33	33
Washington Ry. & Electric Company (preferred)	89	89
West End Street Railway, Boston (common)	84½	84¼
West End Street Railway, Boston (preferred)	100¾	*100¾
Westinghouse Elec. & Mfg. Company	*70½	72
Westinghouse Elec. & Mfg. Company (1st pref.)	*129	*129

a Asked. *Last sale.

Report of the Hudson & Manhattan Railroad

A report to the stockholders of the Hudson & Manhattan Railroad contains the following comparative statement of income:

	Quarter Ended Sept. 30, 1909.	Dec. 31, 1909.	March 31, 1910.
Gross revenue—passenger fares	$361,398	$550,764	$620,529
Miscellaneous revenue from railroad operations:			
Advertising	$9,108	$15,033	$18,265
Other car and station privileges	3,184	5,741	7,983
Sale of power	627	1,188	1,726
Miscellaneous transportation revenue	45	82	27
Other miscellaneous revenue	37	93	496
Total miscellaneous railroad revenue	$13,001	$22,137	$28,047
Total railroad revenue	$374,399	$572,901	$648,576
Operating expenses of railroad:			
Maintenance of way and structures—			
Actual	$23,213	$32,612	$34,512
Reserve	27,100	25,498	14,527
Maintenance of equipment—			
Actual	6,294	12,029	10,524
Reserve	19,866	17,572	7,400
Traffic expenses	4,006	3,706	13,35,
Transportation expenses	100,445	168,675	151,991
General expenses	15,172	17,230	28,797
Total operating expenses of railroad	$196,096	$277,322	$261,110
Net revenue from railroad operation	$178,303	$295,579	$387,466
Hudson terminal buildings:			
Gross rentals	$302,660	$318,946	$319,929
Miscellaneous income	5,152	5,450	6,242
Total revenue from Hudson terminal buildings	$307,812	$324,396	$326,171
Less assumed leases in other buildings	5,970	5,988	5,787
	$301,842	$318,408	$320,384
Less maintenance and operating expenses—			
Actual	$88,444	$87,685	$81,985
Reserve	21,704	20,251	10,000
Total operating expenses of terminal buildings	$110,148	$107,936	$91,985
Net revenue from Hudson terminal buildings	$191,694	$210,471	$228,399
Income Greenwich and Tenth Street properties (net)	898	1,324	1,074
Total net revenue from outside operations	$192,592	$211,795	$229,473
Total net revenue from all operating sources	$370,895	$507,374	$616,938
Deduct taxes accrued on properties operated	45,930	54,000	54,000
Operating income (revenue over expenses and taxes)	$324,965	$453,374	$562,938
Add non-operating income	2,463	2,106	833
Gross income	$327,428	$455,480	$563,771
Income deductions:			
Interest on total bonds outstanding	$680,790	$686,550	$714,320
Less interest chargeable to construction	364,350	286,235	201,505
Balance, being interest on capital employed in operation and chargeable against income	$316,440	$400,315	$512,815
Interest on car purchase agreement	....	....	7,092
Rentals, city of New York	6,422	6,615	6,614
Rental tracks, yards and terminals	21,917	29,851	33,208
Amortization of debt discount	162	243	2,996
Total income deductions	$344,941	$437,024	$562,725
Net corporate income carried to surplus account	*$17,513	$18,456	$1,046
Percentage of railroad operating expenses vs. railroad revenue	52.38	48.41	40.26
Percentage of railroad operating expenses, exclusive of depreciation	34.03	37.35	36.88
Number of car-miles operated (active)	916,086	1,599,369	1,507,704
Total revenue per car-mile from railroad, cents	40.87	35.82	43.02
Operating expenses per car-mile, cents	21.41	17.34	17.32
Net revenue per car-mile, cents	19.46	18.48	25.70
NOTE—Depreciation included in above operating expenses and set up in amortization reserves	$68,670	$63,320	$31,928

*Deficit.

W. G. McAdoo, the president, states in the report in part:

"The uptown section from Hoboken, N. J., was opened for business on Feb. 26, 1908, and the downtown section on July 19, 1909. It was not, however, until Aug. 2, 1909, that full service was established between Hoboken, N. J., and the Hudson terminal, New York City.

"As showing the rapid growth of traffic, the total number of passengers carried in August, 1909, was 2,662,237, or an average of 85,846 per day; whereas the number of passengers carried for March, 1910 was 4,398,017, or an average of 141,871 per day. The total number of passangers carried for the quarter ending March 31, 1910 is 12,410,573, indicating a total traffic for the year 1910, on the basis of the present operation, of more than 49,000,000 passengers. These figures may be exceeded, as the monthly traffic from the date of the opening of the road has shown a steady increase.

"The operation by the Pennsylvania Railroad of its through Western and Southern service to its new terminal at Seventh Avenue and Thirty-second Street, New York, will not, in the opinion of your officers, adversely affect your company. On the contrary, when the new high-speed line to Newark is in operation, your company will receive a larger business from the Pennsylvania Railroad Company than it now does.

"Your board of directors has believed from the beginning that it was highly important to so construct your system of tunnels that large capacity for present and future traffic would be provided. Consequently, all grade crossings have been eliminated, commodious terminal facilities have been provided, and in all the features of your system large provision has been made for the future. The platforms of all stations have been built to accommodate 8-car trains. In this respect your system has a larger provision than the New York subway, because the length of the local platform in the subway is sufficient only for 5-car trains, except at express stations. Your system is, in effect, a 4-tracked railroad, and its total capacity, based upon 8-car trains operated on a minute and one-half headway during the rush hours, is 220,000,000 passengers per annum. At the present time your company is using less than one-fourth of its estimated capacity. This reserve is an asset of real value, because your company is able to take care of future growth for many years to come without additional expenditure.

"In the construction of your system, the terminal stations have been made large enough to receive two additional tunnels under the Hudson River at Cortlandt and Fulton Streets, New York. It was necessary to construct the headings for these tunnels before the completion of the Hudson terminal in order that the new tunnels may be built without disturbing operation. This involved additional outlay, upon which the company cannot receive any immediate return, but it is a wise provision for the future and is an element of value.

"Your terminal station below grade has been designed and constructed upon a scale which will enable it to take care comfortably of the maximum estimated traffic of your system. It has five tracks and six platforms, with a loop operation, so that trains may be despatched upon the most frequent possible headway and with a minimum of time for loading and unloading. Passengers are discharged from one platform and taken in from another, thus avoiding collision between incoming and outgoing passengers and reducing to a minimum the time within which a train may be loaded and unloaded. This station has a concourse below grade, containing approximately two acres of floor space. Here are ticket offices for the trunk line railroads, baggage facilities, waiting rooms, telephone and telegraph facilities, and all the other accessories of a first-class railroad terminal. In addition, booth space has been provided for various small shops and trades, a large percentage of which have been rented on a profitable basis.

"Above the terminal station there have been erected two 22-story office buildings, containing approximately 25 acres of rentable floor space. These buildings were opened for business on May 1, 1908, since which they have been highly successful. About 87 per cent. of the entire office space has been leased—much of it for a long term of years—to an exceptionally high grade of tenants.

"Upon the opening of these buildings, it was deemed wise for the company to assume leases of certain tenants

who were taken from other office buildings. There seems to have existed a great deal of misinformation about these assumed leases. I may say that no more intelligent thing has been done by your management than the assumption of these leases. By so doing, your company secured tenants for long terms of years, thus filling up the buildings, and at comparatively small cost. The total cost to your company for leases so assumed will amount, for the year ending May 1, 1911, to less than $24,000 gross. When unoccupied space belonging to your company in other buildings is rented, at market prices, there will be a further reduction of $10,000 per annum in your company's liability on assumed leases.

"The gross rent roll from the Hudson terminal buildings for the year beginning May 1, 1910, will approximate $1,400,000. At the minimum schedule of rentals for the terminal buildings, $200,000 of space remains unrented. In the opinion of your management, this will largely be disposed of during the coming year. Our experience with the Hudson terminal buildings is that rentals are being constantly made outside of what is commonly called the rental season.

"An interesting test of the capacity of the tunnels was had on Feb. 28, 1910, when a heavy fog hung over the Hudson River for the entire day. Notwithstanding the small amount of equipment available, approximately 195,000 people were carried by the tunnels that day, with a maximum of only 137 cars in service. There was, of course, congestion during the rush hours, which would not have occurred if the company had been in possession of more cars, but, in spite of that, the business was cared for with ease and despatch. The results are highly creditable to the operating department. At the same time, it demonstrates that your system, as laid out, constructed and equipped, has fully measured up to expectations.

"There is an element of great strength in your property, in the fact that you have a short haul and a great density of traffic.

"As important portions of your system are still under construction, and the operated portion represents only a part of the total capital expenditure and capacity, interest charges on bonded debt have been apportioned between operation and construction. There is now being charged to operation interest on a total of $45,028,000 bonds, and there is being charged to construction the interest on $19,647,000 of bonds. With the extension of service over those parts of the line now under construction, the amount of interest charged to operation will be increased and that charged to construction will be reduced, so that the charge of interest to construction will progressively disappear. It is a universal practice to charge to construction the cost of money during the period of construction, and the division of this charge between operation and construction has been made on a basis which, in the opinion of your management, is sound and conservative.

"Complying with the suggestions of the Public Service Commission of New York, we established, over a year ago, the practice of charging off and setting up depreciation and amortization reserves, with the result that, at March 31, 1910, in addition to actual expenditures, maintaining the property up to the highest point of efficiency, we had absorbed in operating expenses and set up a reserve of $257,368. Although a better showing of net earnings might be made by less conservative methods of accounting, we believe that future results will reflect the wisdom of the policy which has been adopted."

American Railways, Philadelphia, Pa.—The directors of the American Railways have formulated an answer to the proposed plan of readjustment which was suggested by the Interstate Railways. The answer of the American Railways had not been made known up to Oct. 17, 1910, but it was intimated that it is not wholly favorable to the proposed plan.

Atchison Railway, Light & Power Company, Atchison, Kan.—The stockholders of the Atchison Railway, Light & Power Company have voted to authorize an increase in the capital stock of the company from $900,000 to $1,500,000 to provide for improvements and extensions.

Chicago (Ill.) Consolidated Traction Company.—Judge Peter S. Grosscup, of the United States Circuit Court, has entered a decree directing the sale of the property of the Chicago Consolidated Traction Company and its eight underlying companies. Under the terms of the decree each property will be sold separately. The sale will be held under the direction of Special Master Henry W. Bishop, who is required to advertise the properties four weeks before considering bids. The sale will be held at a date which remains to be fixed. The appraised valuation of the properties is about $4,000,000, while the debts of the corporations aggregate $6,687,642.

Chicago & Southern Traction Company, Chicago, Ill.—Joseph E. Otis and Matthew Slush, president of the Chicago & Southern Traction Company, have been appointed receivers of the company. Interest on the $2,500,000 of first mortgage bonds of the company is in default.

Forty-second Street, Manhattanville & St. Nicholas Avenue Railroad, New York, N. Y.—The sale of the property of the Forty-second Street, Manhattanville & St. Nicholas Avenue Railroad under foreclosure has been postponed from Nov. 16, 1910, to Dec. 15, 1910.

Gainesville Railway & Power Company, Gainesville, Ga.—Judge W. T. Newman in the United States District Court, issued an order on Oct. 14, 1910, addressed to H. H. Dean, receiver of the property of the North Georgia Electric Company, directing him to purchase certain machinery necessary to the conduct and maintenance of the railway. The amount involved is not specified, but the court order shows that S. Fahs Smith, Boston, who purchased the property of the company at the receiver's sale, has entered no objection to the purchase being made.

Hudson River & Eastern Traction Company, Ossining, N. Y.—The Hudson River & Eastern Traction Company has applied to the Public Service Commission of the Second District of New York for authority to issue $50,000 of additional common stock and $850,000 additional first mortgage bonds, to complete the construction of its line from its present terminus in the Camp Woods, Ossining, to White Plains, a distance of approximately 14 miles, exclusive of sidings.

Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.—Nov. 10, 1910, has been fixed as the date for the sale of the property of the Indianapolis & Cincinnati Traction Company under foreclosure. Mention of the decree ordering the sale of the property was made in the Electric Railway Journal of Oct. 8, 1910, page 672.

Melbourne Tramway & Omnibus Company, Ltd.—Traffic receipts for the year ended June 30, 1910, were £593,423, an increase of £15,192 over the preceding year. The number of passengers carried was 70,305,906, an increase of 2,111,854.

Metropolitan Street Railway, New York, N. Y.—Judge Lacombe in the United States Circuit Court has made an order giving permission to the District Attorney to proceed against Adrian H. Joline and Douglas Robinson, receivers of the Metropolitan Street Railway, for the collection of the State franchise tax.

Philadelphia (Pa.) Rapid Transit Company.—The petition requesting E. T. Stotesbury, of Drexel & Company, Philadelphia, Pa., to become a director of the Philadelphia Rapid Transit Company follows: "The undersigned stockholders of the Rapid Transit Company and the Union Traction Company take this method of presenting their request to you that you enter the board of the Philadelphia Rapid Transit Company, with such associates as you may select, in order to give this property not only the great practical advantage of your large experience in business and as a financier, but also because of the full measure of public confidence which will result from the participation of yourself and associates in the direction and control of the company. This move is made with the knowledge and assent of the present officers and directors, and with the assurance that sufficient vacancies on the board will be available to enable the interest which may come in with you to control the policy and business of the company. There is no enterprise which touches so closely the general welfare of a city and the convenience and comfort of its citizens as the local transportation problem. This is especially true in Philadelphia by reason of the close relations between the company and the city under the contract of 1907. We believe that nothing will do so much to rehabilitate the company in public opinion, and so add to the prosperity of the city,

as a management which will be recognized as having for its first consideration the city's interest. We turn to you as the citizen who, in our opinion, can accomplish most along these lines, and we appeal to your well-known civic pride to give to this public service corporation, and through it to the city, the benefit of your personal and business interest and association."

Public Service Corporation of New Jersey, Newark, N. J.—Potter, Choate & Prentice, New York, N. Y., are offering the unsold portion of $1,500,000 of 3-year collateral 5 per cent notes of the Public Service Corporation of New Jersey, due Oct. 1, 1913, at a price to yield 5½ per cent. The total amount outstanding is $4,000,000. These notes are secured by $5,000,000 of Public Service Corporation of New Jersey general mortgage 5 per cent bonds, due Oct. 1, 1959. It is understood that more than two-thirds of the notes have been sold.

St. Albans (Vt.) Street Railway.—The bondholders of the St. Albans Street Railway have appointed a committee consisting of Francis H. Dewey, Worcester; F. H. Mills, Boston; George C. Whitney, Worcester, and Arthur M. Taft, Worcester, to assist in reorganizing the company.

Twenty-eighth & Twenty-ninth Streets Crosstown Railroad, New York, N. Y.—The sale of the property of the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad, which was to have been held on Oct. 3, 1910, has been indefinitely postponed.

Washington, Alexandria & Mt. Vernon Railway, Washington, D. C.—The stockholders of the Washington, Alexandria & Mt. Vernon Railway have approved a joint agreement for the consolidation of the Washington, Alexandria & Mt. Vernon Railway, the Washington, Arlington & Falls Church Railway and the Washington-Virginia Railway.

Yonkers (N. Y.) Railroad.—The Public Service Commission of the Second District of New York has authorized Leslie Sutherland as receiver of the Yonkers Railroad to issue receivers' certificates to the sum of $160,000 bearing interest at 6 per cent, payable in not exceeding two years from date. The proceeds are to be used to buy an additional engine, relay and renew tracks on Warburton Avenue, relay and renew tracks on Park Avenue and Palisade Avenue, and pay for placing the tracks on McLean Avenue.

Dividends Declared

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

Binghamton (N. Y.) Railway, 2½ per cent.

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.

Columbus (Ohio) Railway, quarterly, 1¼ per cent, preferred.

Connecticut Railway & Lighting Company, New Haven, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Dallas (Tex.) Electric Corporation, 3 per cent, first preferred; 1 per cent, second preferred.

East St. Louis & Suburban Railway, East St. Louis, Ill., quarterly, 1¼ per cent, preferred.

Ft. Smith Light & Traction Company, Ft. Smith, Ark., quarterly, 1¾ per cent, preferred.

Georgia Railway & Electric Company, Atlanta, Ga., quarterly, 1¼ per cent, preferred.

Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.

Havana (Cuba) Electric Railway, quarterly, 1½ per cent, preferred; quarterly, 1½ per cent, common.

Macon Railway & Light Company, Macon, Ga., 3 per cent, preferred; 1½ per cent, common.

Mexico (Mex.) Tramways, quarterly, 1¾ per cent.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.

Montreal (Que.) Street Railway, quarterly, 2½ per cent.

Railways Company General, New York, N. Y., quarterly, 1 per cent.

Rio de Janeiro Tramway, Light & Power Company, Rio de Janeiro, Brazil, 1¼ per cent, quarterly.

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

Youngstown & Ohio River Railroad, Youngstown, Ohio, three-quarters of 1 per cent, preferred.

Traffic and Transportation

The Indiana Accidents

The Indiana Railroad Commission has decided that while under the commission law of 1907 it could compel the trainmen involved in the recent interurban wrecks to testify at hearings, after requiring them to testify they could not be prosecuted in the criminal courts on charges of involuntary manslaughter. In the matter of summoning and examining witnesses the law provides "that such evidence or testimony shall not be used against such person (witness) in the trial of any criminal proceedings, nor shall any such witness so compelled (by the commission) to testify against himself be thereafter prosecuted for any crime concerning which he has been compelled to give testimony." The commission has further discovered that the law seems to overlook interurban electric railways and the members are inclined to believe that the prosecuting officials cannot sustain the charges of involuntary manslaughter against the trainmen because the Indiana statute relating to interurban railways does not make it a criminal offense for an interurban trainman to disobey orders in the operation of his car, although it is criminal for the operator of a train on a steam railroad to disobey orders. Two of the trainmen involved in the Tipton wreck on the line of the Indiana Union Traction Company and the conductor involved in the Kingsland wreck on the line of the Ft. Wayne & Wabash Valley Traction have been arrested and were to have been arraigned on Oct. 11, 1910. The commission is preparing its report on the Kingsland and Tipton wrecks and will probably advocate publicity hereafter in connection with all accidents. The commission believes that the law which regulates the making of investigations so binds the members of the commission that the report of the investigation cannot be made public until it is found that the electric railways have failed to follow the recommendations of the commission. Heretofore the reports of investigations made by the commission have not been made public until issued in the annual report so as to prevent the information contained in them from being used to prejudice cases against the railroads for damages.

Order Regarding Switch Targets and Lights in Michigan

The Michigan Railroad Commission has adopted the following order regarding the use of switch targets and lights at all main line switches of interurban railroads owned and operated by the Detroit United Railway in Michigan outside of cities and villages, where the movement of cars is slow:

"It having come to the knowledge of the Michigan Railroad Commission that there are a number of switch stands at main line switches of interurban railroads owned and operated by the Detroit United Railway in Michigan that are not provided with targets and lights, the commission after having given this matter careful consideration is of the opinion that all main line switch stands should have targets and lights as an additional safeguard for the safe operation of cars on said Detroit United Railway's interurban railroads.

"Therefore, it is hereby ordered, that the said Detroit United Railway within 90 days from service hereof cause to be placed and thereafter effectively maintained targets and lights on all main line switch stands on its interurban railroads owned and operated in Michigan that are not now so equipped, and

"It is further ordered, that the targets provided for in this order shall be prominent and show only when set for side track."

Service Between Ogden and Willard.—The Ogden Rapid Transit Company, Ogden, Utah, has placed in operation its new interurban line between Ogden and Willard.

Fender Recommendation in Portland.—The street committee of the City Council of Portland, Ore., has voted to recommend the use of the Nelson automatic fender on street cars operated within the limits of Portland.

Request for Increase in Wages Refused.—The Berkshire Street Railway and the Pittsfield Electric Street Railway, Pittsfield, Mass., have refused the request of the employees of the companies for an increase in wages at this time.

Freight Service Over the Northern Electric Railway.—The Northern Electric Railway, Chico, Cal., has commenced a daily 2-car freight service from points in Butte County to Sacramento in conjunction with the Western Pacific Company. It is proposed to transport grapes directly to the San Francisco markets by routing the cars over the new road.

Freight Service Between Louisville and Shelbyville.—The Louisville & Eastern Railway, Louisville, Ky., announced that freight and express service on the line from Louisville to Shelbyville would be started on Oct. 17, 1910. The management of the company is highly pleased with the passenger traffic over the new line from Louisville to Shelbyville.

Petition Against Rochester, Syracuse & Eastern Railroad.—Residents of Port Gibson have petitioned the Public Service Commission of the Second District of New York to require the Rochester, Syracuse & Eastern Railroad, Syracuse, N. Y., to stop its limited cars at Port Gibson and to require the company to place the name "Port Gibson" on timetables, etc.

Employment of Traffic Expert Recommended in New Haven.—The committee on railroads and bridges of the City Council of New Haven, Conn., has recommended to the Council that an appropriation of $2,000 should be made by the Council to defray the expenses of retaining an expert to study street railway traffic conditions in New Haven and report its findings to the Council.

Schenectady Railway Asked to Make Additional Stop.—The Public Service Commission of the Second District of New York has served upon the Schenectady Railway the complaint of residents of Schenectady, Ballston Spa, and other places against the company asking that passenger cars on the Saratoga Division be required to stop at a point known as Dry Bridge, about two miles northeast of Ballston Spa.

Accident on Boston Elevated Railway.—At 7:31 p. m. on Oct. 15, 1910, an inward-bound Western Avenue car of the Boston (Mass.) Elevated Railway tipped over at the corner of Charles Street and Cambridge Street. Four persons were killed and about thirty taken to hospitals. The car was in charge of Motorman J. J. Walsh, who was killed, and Conductor J. L. Purcell. Motorman Walsh had been employed by the company since Jan. 15, 1901.

Suburban Passenger Development at Louisville.—Owing to the rapid development of the business of the Louisville & Northern Railway & Lighting Company and the Louisville & Southern Indiana Traction Company out of Louisville to New Albany and Jeffersonville, the Pennsylvania Railroad has lost the larger part of its suburban business and has provided a "dinky" service between the three cities. In order to make a stronger appeal it is reported that the company will institute a half-hourly service.

"Through the West Virginia Hills."—The Fairmont & Clarksburg Traction Company, Fairmont, W. Va., has issued a folder entitled "Through the West Virginia Hills," in which is described and illustrated the territory through which the company operates. A feature of the publication is a map showing the lines of the company in Marion, Harrison and Lewis Counties, West Virginia. The cover is decorated with a half-tone which shows a car of the company about to take a siding at a particularly picturesque point along the company's line.

Strike in New Jersey.—After being on strike 36 hours dating from Oct. 11, 1910, the conductors and motormen in the employ of the Riverside Traction Company, Trenton, N. J., returned to work with the understanding that a sliding scale of wages of from 21 cents an hour to 24 cents an hour would be established; that five recently discharged employees would be reinstated; that they would be permitted to use stools between towns and that further grievances would be settled by arbitration. The company absolutely refused to treat with the union or its representatives, and the agreement which has been made is with a representative committee of the employees.

The Trolley Trail.—The Pacific Electric Railway, Los Angeles, Cal., has published "The Trolley Trail" as a souvenir to be given to visitors to Southern California. The publication was first distributed at the recent meetings of the bankers at Los Angeles. Across the upper part of every page of the booklet is an etching of a scene along the Pacific Electric Railway, while across the lower part of every page is a half-tone illustration. The scenes presented cover a trip from the various beaches, the harbor and Catalina, to the summit of Mount Lowe, including Pasadena, San Gabriel, Alhambra, Glendora, Covina, Santa Ana and other points on the Pacific Electric Railway.

New Transfers in Brooklyn.—On Oct. 15, 1910, the Brooklyn (N. Y.) Rapid Transit Company placed in operation the new transfer system designed especially to compel passengers who transfer to travel in one general direction. An extended reference to this change in the transfer system of the company was published in the Electric Railway Journal of Sept. 24, 1910, page 483. The Public Service Commission adopted a resolution for a hearing on Oct. 19, 1910, on the complaint of John J. A. Rogers against the Brooklyn Heights Railroad, the Sea Beach Railway and the Nassau Electric Railroad, three companies in the Brooklyn Rapid Transit system, because of the new scheme of transfers.

Detroit United Railway Increases Limited Service.—The new schedules on the interurban lines of the Detroit (Mich.) United Railway, which went into effect on Oct. 4, 1910, contain many changes, due to increase in the number of limited cars. On the line to Jackson the limiteds leave Detroit at 8:15 a. m. and every two hours to 6:15 p. m., giving six instead of four fast cars. For Port Huron the limiteds leave at 7 a. m. and every two hours to 7 p. m., making seven daily, while for Flint the limiteds leave at 7:35 a. m., 9.35 a. m., 12:35 p. m., 2:35 p. m. and 4:35 p. m. Starting with the first, alternate limiteds will run through to Saginaw. No change has been made with the Toledo limited service.

Hearing on Freight Petition at Boston.—The petition of the Boston Elevated Railway for the right to carry baggage, express matter and freight on its cars within the limits of Boston was opposed by only one person at the public hearing given on the matter by the City Council on Oct. 14, 1910. James H. Brennan, who opposed the application, characterized the scheme as the forerunner of a great electric railway express trust. Secretary Eastman, of the public franchise league, appeared before the committee to offer suggestions for restrictions in the granting of the petition and to state that the franchise league will later make further suggestions on the matter. He said that though no official action has yet been taken by the league the members are inclined to favor the petition.

Pittsburgh Restrained from Enforcing Overcrowding Ordinance.—Judge Macfarlane has granted the Pittsburgh (Pa.) Railways a preliminary injunction to prevent the city from entering suits against the company for alleged overcrowding of cars as defined in two ordinances passed by the Council recently. In granting its order the court said in part: "This is a plain case for granting a preliminary injunction to preserve the status quo until final hearing of the case. To refuse to do so would deprive the defendant of the right to challenge the ordinances and thus deny it the equal protection of the law." Judge Frazer has decided that the recent transfer ordinance passed by the City Council is void. The city sued to recover $100 penalty for violation of the transfer ordinance.

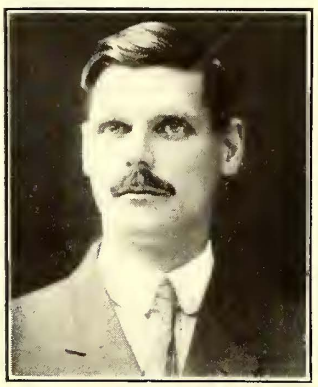
Settlement of Controversy Over Baggage at Santa Monica.—The suit brought by Santa Monica against the Los Angeles-Pacific Railway to force that company to carry baggage on passenger tickets will not be heard by the Interstate Commerce Commission. The City Council has decided to accept the settlement proposed by the company and will request that the action be dismissed. The request follows the agreement of the Southern Pacific Railroad to place Santa Monica as a place of destination in its ticket offices throughout the country and the subsequent agreement of the Los Angeles-Pacific Company to check baggage and carry passengers on interstate trips. For some time Santa Monica has been dependent on electric traction for communication with Los Angeles, the former steam road having been rebuilt and equipped with electricity.

Personal Mention

In the daily edition of the Electric Railway Journal for Oct. 14, 1910, a biography and portrait were published of Mr. A. W. Brady, the newly elected president of the American Electric Railway Association, and in the Electric Railway Journal of Oct. 15 a biography and portrait were published of Mr. W. H. Forse, Jr., the newly elected president of the American Electric Railway Accountants' Association. Portraits and biographies of Mr. W. J. Harvie, the newly elected president of the American Electric Railway Engineering Association; Mr. H. C. Page, the newly elected president of the American Electric Railway Transportation & Traffic Association; Mr. Harry V. Drown, the newly elected president of the American Electric Railway Claim Agents' Association, and Mr. Norman Litchfield, the newly elected secretary of the American Electric Railway Engineering Association, are now given.

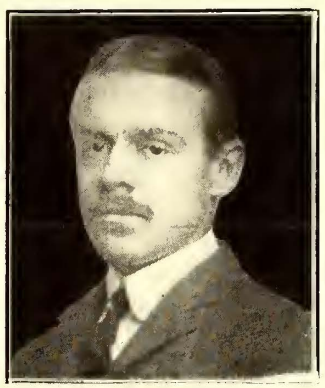
Mr. Harvie was graduated with the degree of electrical engineer from Syracuse University, Syracuse, N. Y., and entered the railway field in 1899 in the overhead department of the Syracuse Rapid Transit Railway. In 1900, he was employed by the Syracuse, Lakeside & Baldwinsville Railroad in various capacities in the car shops and power houses, and in 1901, he became connected with the Syracuse & Suburban Railroad as electrical engineer. In the fall of 1901, Mr. Harvie was employed by the Andrews-Stanley Syndicate of Utica on construction work on the Little Falls extension, which that company was building.

H. C. Page



W. J. Harvie

H. V. Drown



N. Litchfield

In 1902, he was appointed electrical engineer of the Utica & Mohawk Valley Railway in charge of power installation, which comprised one of the earliest 20,000-volt transmission lines with substations to be installed in the East. Later, his jurisdiction was extended to the mechanical department of the Utica & Mohawk Valley Railway and then to the Oneida Railway, the electrification of the West Shore Railroad being under his direct supervision. In 1908, Mr. Harvie became chief engineer of the Syracuse Rapid Transit Railway, as well as of the Utica & Mohawk Valley Railway and the Oneida Railway, which title covers the mechanical and electrical departments, but not the maintenance of way. The Syracuse Rapid Transit Railway, the Utica & Mohawk Valley Railway and the Oneida Railway cover city, suburban and interurban work and operate from Syracuse to Little Falls and include the electrified West Shore Railroad, the whole comprising a mileage of 251 miles.

Mr. Page is about 46 years of age. He began his railway career some 25 years ago as a conductor with the Lynn & Boston Street Railroad, which he served for three years. He was rapidly promoted with this company, and finally was placed in complete charge of the schedule arrangement and car dispatching. When the Boston & Northern Street Railway was formed Mr. Page was retained by it and was promoted from time to time until he became general superintendent, having charge of 405 miles of track. In this capacity Mr. Page was particularly successful in his handling of the employees and his arrangement of the schedules. In 1903 he became general manager of the Berkshire Street Railway, Pittsfield, Mass., and remained with that company until June, 1905, when the property passed into the hands of the New York, New Haven & Hartford Railroad. At the same time the Springfield Street Railway was also taken over by the New York, New Haven & Hartford Railroad, and Mr. Page was appointed general manager of the Springfield Street Railway. In November, 1907, Mr. Page was elected vice-president of the Springfield Street Railway, and continued in this capacity until September, 1909, when he was appointed general manager of the Worcester Consolidated Street Railway and affiliated companies to succeed Mr. E. G. Connette. In 1907 Mr. Page was elected president of the New England Street Railway Club. He has always been active in the affairs of that organization.

Mr. Drown was born at Spartansburg, Pa., on Oct. 18, 1876. His first railway work was with the Consolidated Traction Company, Pittsburgh, Pa., which has since been merged with the other companies in the Pittsburgh Railways Company. He entered the claim department of the Consolidated Traction Company in 1898 and served in various positions. In March, 1901, Mr. Drown became connected with the Cincinnati Traction Company as assistant claim agent, and on March 1, 1903, he entered the employ of the Aetna Insurance Company, as an adjuster in the Pittsburgh district. On April 1, 1903, he became connected with the Rhode Island Company, Providence, R. I., as claim agent. In February, 1907, Mr. Drown accepted the position of assistant general claim agent of the Public Service Railway. On Aug. 1, 1907, he was made general claim agent of the company. At present, Mr. Drown is claim agent of Public Service Railway, Public Service Gas Company and Public Service Electric Company.

Mr. Litchfield is engineer of car equipment of the Interborough Rapid Transit Company, New York, N. Y. Mr. Litchfield is 31 years of age, and is a graduate of Stevens Institute of Technology with the degree of M.E. His entire professional career has been devoted to electric railways, and in particular to car equipment. He has been connected with the Interborough Rapid Transit Company since the commencement of operation of the New York subway system, and prior to that time was employed under Mr. L. B. Stillwell in the preparation of the plans for the equipment of the road and in the supervision of the experimental cars. Before he became connected with the Interborough Rapid Transit Company, Mr. Litchfield served an apprenticeship in street and elevated railway car equipment in the shops of the Brooklyn Rapid Transit Company.

Mr. R. A. Smith has been appointed assistant manager of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., to succeed Mr. Joseph B. Stewart, resigned.

Mr. T. O. Brown, who is connected with Redmond & Company, New York, N. Y., has been elected president of the Augusta-Aiken Railway & Electric Company, Augusta, Ga., to succeed Mr. C. C. Tegethoff, resigned.

Mr. W. C. Forbess, general passenger and claim agent of the Northern Texas Traction Company, Fort Worth, Tex., has been appointed assistant manager of the company and not general superintendent as was previously announced.

Construction News

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

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

RECENT INCORPORATIONS

Gough Street Railroad, San Francisco, Cal.—Incorporated in California to build an electric railway from the corner of Gough Street and McAllister Street, extending south along Gough Street to Haight Street, there to connect with existing lines. Capital stock, $60,000. Incorporators: A. J. Pon, David Livingston and Charles Loesch. [E. R. J., Oct. 1, '10.]

Pittsburgh, Steubenville & Wheeling Railway, Pittsburgh, Pa.—Incorporated in West Virginia to build an electric railway to connect Pittsburgh and Wheeling via Mount Lebanon, Ridgeville, Millers Run, Reising, McDonald, Midway, Burgettstown, Cross Creek, Avells and Independence. Incorporators: W. H. Hildebrand, Pittsburgh; H. G. Young, John C. Bond, Homer Gray and V. H. Stewart, all of Charleston. [E. R. J., Aug. 13, '10.]

FRANCHISES

Vancouver, B. C.—The Municipal Council has approved the plans of the British Columbia Electric Railway, Ltd., Vancouver, for building several miles of extension of its tracks in Point Grey.

San Francisco, Cal.—Thomas W. Forsythe, representing the United Railroads, San Francisco, has been granted a franchise by the Board of Supervisors for the proposed extension of the Masonic Avenue line to Pacheco Street in San Francisco.

Atlanta, Ga.—The Atlanta & Carolina Railway has been granted a renewal of its franchise by the County Commissioners to extend its railway from the city limits in Atlanta out Confederate Avenue, through Fulton County. Surveys are nearly completed and contracts for grading will soon be let.

Troy, Ill.—The St. Louis & Eastern Traction Company, East St. Louis, has been granted a franchise by the City Council to build a railway through Troy. The franchise calls for the beginning of the work within one year from date and the completion and operation of the line is required within two years. This proposed railway will connect Granite City and Greenville via Collinsville, Troy, St. Jacob, Highland, Pierson and Pocahontas. A. W. Crawford, Hillsboro, is interested. [E. R. J., Oct. 15, '10.]

Burlington, Ia.—The Rock Island Southern Railroad, Monmouth, will ask the City Council for a franchise to build its tracks in Burlington. This company is securing the right-of-way for an extension of its line between Monmouth and Burlington via Macomb and Oquawka. A bridge will be built across the Mississippi River at Oquawka. Moline, Ill., and Burlington, Ia., will be the terminals.

Covington, Ky.—The Covington, Big Bone & Carrollton Railroad has asked the City Council for a franchise to extend its tracks in the lower section of Covington. The company plans to build a 22-mile railway to connect Covington and Big Bone. M. J. Crouch is interested. [E. R. J., June 18, '10.]

Charlotte, N. C.—It is stated that Paul Chatham, representing the Charlotte Rapid Transit Company, will apply to the Board of Aldermen for a franchise to build a railway over and along East Fourth Street in Charlotte. [E. R. J., Aug. 27, '10.]

San Antonio, Tex.—The San Antonio Traction Company has asked the City Council for a franchise to extend its line to the East End of San Antonio. Construction will begin as soon as the franchise is granted.

Provo, Utah.—A. J. Evans and S. L. Chipman, representing the Utah & Salt Lake Electric Railway, have been granted a 100-year franchise to build an electric railway through Provo. This is part of a plan to construct a railway from Salt Lake City to Payson via Sandy, Draper, Murray, Lehi, American Fork, Pleasant Grove, Provo, Springville and Spanish Fork. Franchises have been granted from all cities in Utah County, except Spanish Fork. [E. R. J., Sept. 17, '10.]

Madison, Wis.—The Chicago & Wisconsin Valley Railway, Madison, has been granted a franchise by the Common Council to build an interurban railway from Wausau to Madison via Stevens Point and Portage. Allen T. Russell, Chicago, general manager. [E. R. J., Sept. 24, '10.]

TRACK AND ROADWAY

Calgary (Alta.) Municipal Railway.—This company is said to be planning to extend its lines for about 22 miles, provided the necessary appropriation is obtained. The bids are to include the delivery of material in the spring of 1911.

Phoenix (Ariz.) Railway.—This company is said to have announced that it will spend about $135,000 in Phoenix and vicinity on improvements and extensions of the line before July 1, 1911.

Texarkana Gas & Electric Company, Texarkana, Ark.—This company is said to be preparing plans for building several extensions of its railway in Texarkana. The extensions will total about 5 miles. W. L. Wood, general manager.

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company has completed and placed in operation the 75-mile extension of its railway connecting Vancouver, New Westminster and Chilliwack.

Fairview Interurban Railroad, Delta, Col.—This company, recently incorporated, advises that it is now grading and construction will begin in the near future on its proposed 25-mile electric railway to connect Delta and Fairview Coal Mine with a branch to Cedaredge, California Mesa and Montrose. Capital stock, authorized, $250,000. Repair shops will be located at Delta and the power house will probably be at Fairview Mine. Power for lighting purposes is being contemplated. Incorporators: Charles G. Montz, 1154 Clarkson Street, Denver; Mudge Zeigler, Henry Zeigler and Watson Z. Zeigler. [E. R. J., Oct. 8, '10.]

Uncompahgre & Gunneson Valley Railroad, Montrose, Col.—This company, recently incorporated, advises that construction will be commenced about Mar. 1, 1911, on its proposed 50-mile electric railway to connect Montrose, Olathe, Delta and Cedaredge. Capital stock, authorized, $50,000, to be increased later. The power station will be located 6 miles northwest of Montrose. Officers: F. B. Townsend, 1795 Gilpen Street, Denver, president; I. N. Pepper, Montrose, vice-president; S. A. Sprague, 223 Main Street, Montrose, secretary, and G. A. Frost, treasurer.

Pueblo & Suburban Traction & Lighting Company, Pueblo, Col.—It is stated that this company will soon build an extension of its tracks from La Junta to Pueblo. Surveys are being made. J. F. Vail, general manager.

Irwinton (Ga.) Railway.—This company has awarded contracts for the immediate construction of its proposed 3½-mile electric railway to connect Irwinton and McIntyre. George H. Caiswell, Irwinton, secretary. [E. R. J., Dec. 4, '09.]

Louisville & Northern Railway & Lighting Company, New Albany, Ind.—This company announces that it expects to soon erect a new bridge over Silver Creek, near New Albany.

Tri-City Railway, Davenport, Ia.—This company has secured right-of-way and will begin work at once on the 1-mile extension of its railway on Twenty-seventh Street in Davenport.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—This company announces that it will build an 18-mile extension of its railway from Waterloo to Dike via Cedar Falls. The line will eventually be extended from Diké to Grundy Center and Marshalltown.

Louisville, Lincoln Farm & Mammoth Cave Traction Company, Glasgow, Ky.—This company has completed surveys and work will soon be begun on the section of its proposed railway between Glasgow and Hodgenville. This is part of a plan to build a 50-mile electric railway to connect Hodgenville, Glasgow, Lincoln Farm and Mammoth Cave. J. M. Richardson, president. [E. R. J., Oct. 8, '10.]

New Orleans Railway & Light Company, New Orleans, La.—J. W. Barkdull, New Orleans, is said to be negotiating with this company to extend its railway 16 miles from New Orleans to Greenwell Springs.

Winnipeg (Man.) Electric Street Railway.—This company proposes to build a half-mile double-track extension on Notre Dame Avenue in Winnipeg.

***Winnipeg, Man.**—A. F. Lewis, St. Paul, and associates are said to be interested in a plan to build an electric railway from St. Paul to Winnipeg.

***Hagerstown, Md.**—Press reports state that a new electric railway is soon to be built from Hagerstown to Mercersburg via Clear Spring, a distance of about 25 miles.

Hagerstown (Md.) Railway.—This company is said to be negotiating for an extension of its tracks from Williamsport across the Potomac River into Berkeley County to connect North Mountain, Tomahawk, Glengary and other points.

Berkshire Street Railway, Pittsfield, Mass.—This company has awarded the contract to Fred T. Ley & Company, Springfield, for building its Elm Street extension in Pittsfield. Work will begin at once.

St. Paul Promotion Company, St. Paul, Minn.—This company, recently incorporated, advises that construction will begin early in the spring of 1911 on its proposed network of interurban lines radiating from St. Paul to Farmington, Northfield, Faribault, Mankato and other Southern Minnesota cities. Capital stock, authorized, $100,000. Officers: Phil W. Herzog, president; B. C. Goodkind, vice-president; H. C. Strucken, 810 Metropolitan Building, St. Paul, secretary; James Kasson, treasurer, and W. L. Sontag, 810 Metropolitan Building, St. Paul, general manager. [E. R. J., Oct. 15, '10.]

***Caldwell, N. J.**—William Kerris, Pine Brook, and associates are said to be considering plans for building a proposed 11-mile electric railway to connect Caldwell and Penville.

Cleveland, Barberton, Coshocton & Zanesville Railway, Cleveland, Ohio.—Press reports state that this company has awarded the contract to the Canadian Construction Company, Quebec, Can., for building its proposed electric railway to connect Cleveland and Zanesville via Elyria, Barberton, Orrville, Millersburg and Coshocton. J. J. Breitinger, president. [E. R. J., July 10, '09.]

Muskogee (Okla.) Electric Traction Company.—This company has placed in operation the 2-mile extension of its tracks from Muskogee to the Fair Grounds.

Chambersburg & Western Electric Railway, Chambersburg, Pa.—This company has completed surveys for its projected 7½-mile railway from Chambersburg to St. Thomas. It is said to have secured $100,000 of capital for construction purposes. R. M. Ramsey, Chambersburg, president. [E. R. J., Sept. 10, '10.]

Clarion & East Brady Electric Railway, Clarion, Pa.—This company advises that it will ask at once for bids for the grading of the first section of its line to Reidsburg, a distance of 6 miles, at once. This proposed 30-mile railway will connect Clarion, Reidsburg, Sligo, Rimersburg and East Brady. Capital stock, authorized, $1,000,000. Bonds authorized, $1,000,000. The power house will be located near Clarion and the company will furnish power for lighting. G. E. Arnold, Clarion, president. [E. R. J., May 21, '10.]

Buffalo & Lake Erie Traction Company, Erie, Pa.—This company has submitted plans for building a 900-ft. bridge over the Twenty-mile Creek.

McKeesport, Clairton & Westmoreland Railway, McKeesport, Pa.—This company, it is said, has decided to build an extension of its tracks in McKeesport and Mifflin amounting to 10 miles.

Mahoning & Shenango Railway & Light Company, New Castle, Pa.—This company announces that it will extend its Elm Street tracks to the General Fireproofing Works in Ohio at once. Surveys have been completed and most of the right-of-way secured. M. E. McCashey, Youngstown, general manager.

El Paso (Tex.) Electric Railway.—This company is reported to be considering plans for building a 10-mile extension of its line to Ysleta.

Citizens' Railway, Waco, Tex.—This company has placed in operation the extension of its Sanger Avenue line in Waco.

Ogden (Utah) Rapid Transit Company.—This company has completed and placed in operation the extension of its railway from Ogden to Brigham.

***Roxbury, Utah.**—The Commercial Club, Roxbury, has indorsed a proposition for the building of an interurban railway to connect Roxbury and St. Anthony.

Seattle (Wash.) Electric Company.—This company has begun work on the new extension of its line on North Fortieth Street, Wallingford Avenue, and other streets in Seattle.

South Morgantown Traction Company, Morgantown, W. Va.—This company is surveying for a 12-mile extension of its tracks to the old Fairmount Fair Grounds.

SHOPS AND BUILDINGS

Marion, Bluffton & Eastern Traction Company, Bluffton, Ind.—This company, together with the Bluffton, Geneva & Celina Traction Company, is considering plans for the erection of a union interurban depot in Bluffton. The structure will be 1 and 2 stories, with basement, and of brick construction.

Frederick (Md.) Railroad.—This company, it is said, will erect car houses, workshops and paint shops in Frederick. The structures are to be fireproof, of brick construction, supported with iron girders.

Michigan United Railways, Lansing, Mich.—This company is preparing plans and will soon let contracts for building a new car house in Jackson. The structure will be 180 ft. x 132 ft., with brick walls and saw-tooth roof. A. W. McLimont, general manager.

Rochester, Syracuse & Eastern Railroad, Syracuse, N. Y.—This company has made plans for a freight and passenger station at Savannah which will be built at once by Wethey & Sherman. It will be a 2-story brick building, with a frontage of 39 ft. on Main Street, the site being the same as now used by the company as a shelter.

East Pubnico Amusement Company, Halifax, Nova Scotia.—This company will build stations at Tusket and Port Wade. G. C. McClure, 20 Prince Street, Halifax, chief engineer.

Pittsburgh (Pa.) Railways.—This company is having a number of repairs made on its car house on Seymour Street, Pittsburgh. New tracks are being laid, which will be used for the storage of the open cars during the fall and winter.

Seattle Everett Traction Company, Seattle, Wash.—This company, it is said, has practically completed arrangements to begin work on its new passenger and freight station in Everett. The structure will be a 2-story brick building with a single story annex for the express department.

Sheboygan Light, Power & Railway Company, Sheboygan, Wis.—This company is planning to build a 1-story brick car house, 114 ft. x 180 ft., with steel trusses, fire windows, composition roof, steam heat, plumbing and wiring, in Sheboygan. It will also erect a 2-story brick office building, 70 ft. x 40 ft.

POWER HOUSES AND SUBSTATIONS

Twin City Rapid Transit Company, Minneapolis, Minn.—This company will soon build two new steel stacks at its power house at the east end of the Tenth Avenue bridge in Minneapolis. The estimated cost is about $50,000.

Public Service Railway, Newark, N. J.—This company has awarded a contract to the Westinghouse Electric & Manufacturing Company for two 5000-kva. 13,200-volt, 3-phase, 60-cycle, 1800-r.p.m. turbo-generators. These will be installed in the new power house of the company at Perth Amboy, N. J.

East Pubnico Amusement Company, Halifax, Nova Scotia.—This company will build a power house on Grafton Street and a substation on Albermarle Street, Halifax. G. C. McClure, 20 Prince Street, Halifax, chief engineer.

Steubenville & East Liverpool Railway & Light Company, Steubenville, Ohio.—This company is constructing a new substation near Yellow Creek. The estimated cost is about $12,000.

Wilkes-Barre (Pa.) Railway.—This company, it is said, will soon build a new power house on either the Plymouth or Nanticoke route, outside of Wilkes-Barre. Thomas A. Wright, Wilkes-Barre, general manager.

Manufactures & Supplies

ROLLING STOCK

Macon Railway-Light Company, Macon, Ga., expects to place an order in the near future for eight new cars of the prepayment type.

Calgary (Alta.) Street Railway, reported in the Electric Railway Journal of July 9, 1910, as considering the purchase of 12 new cars, is now in the market for these cars, which will be of the prepayment type.

Edmonton (Alta.) Street Railway has ordered a snow sweeper and six passenger cars from the Ottawa Car Company. The motor equipment and air brakes for these cars have been ordered from the Canadian Westinghouse Company.

Galesburg Railway & Light Company, Galesburg, Ill., noted in the Electric Railway Journal of April 30, 1910, as preparing specifications for several new cars, has ordered six 33-ft. 8-in. closed, single-truck, pay-as-you-enter cars from the Danville Car Company. They are to be equipped with GE-88 motors. Curtis trucks and Brill fare boxes also are specified.

Invercargill Corporation Tramways, Invercargill, New Zealand, invites tenders until Jan. 9, 1911, for supplying the equipment for an electric railway in Invercargill. It asks bids for car bodies, electric car equipment and car trucks. Specifications may be consulted in America at the office of R. W. Cameron & Company, 23 South William Street, New York, and R. W. Hunt & Company, 1121 The Rookery, Chicago, Ill.

East Shore & Suburban Railway, Richmond, Cal., has recently received three new double end cars from the Danville Car Company. The specifications of these cars follow:

Length of body.....36 ft.	Curtain fix.....C. S. Co.
Over vestibules.....48 ft.	Curtain material..Pantasote
Width over sills....8 ft. 6 in.	Headlights..Anderson-Smith
Sill to trolley base..9 ft. 4 in.	Motors.....4 G. E. 67
Interior trim,	Seats .....Brill
oak, old mission finish	Seating material.....rattan
Air brakes.....National	Trucks,
Axles.....4½ in.	Brill No. 27—M. C. B.—1
Bumpers.....channel iron	Wheel base.....6 ft.
Car trimmings,	Wheels.....33 in.
malleable iron and bronze	

TRADE NOTES

J. F. Mingea, assistant purchasing agent of the Hicks Car & Locomotive Works, Chicago, Ill., has accepted a position with the Hall & Sisson Lumber Company, Chicago.

Strauss-Bascule Concrete Bridge Company, Chicago, Ill., has abandoned concrete work and the reference to it in its name, and hereafter the name of the company will be the Strauss-Bascule Bridge Company.

Dr. K. G. Frank, New York, representative of Siemens & Halske A. G. and Siemens Schuckertwerke G.m.b.H., Berlin, Germany, has removed his offices to Room 408 in the West Street Building, 90 West Street.

Northern Engineering Works, Detroit, Mich., report the recent shipment of two 10-ton, 60-ft. span electric traveling Northern cranes to the Detroit Bridge & Steel Works, and two 7½-ton cranes to the Lenoir Car Works, Lenoir, Tenn. The company has also shipped four 55-ft. electric traveling Northern cranes to the Kewanee Boiler Company, Kewanee, Ill., for installation in the addition being built at its plant. These cranes are alternating-current Northern type E design, ranging in capacity from 5 to 15 tons.

ADVERTISING LITERATURE

Barber Car Company, York, Pa., has issued a 12-page booklet, describing and illustrating the features of the new center-entrance Barber cars.

Wright Wrench & Forging Company, Canton, Ohio, is mailing a folder in which are discussed the merits of the quick adjustable Wright wrench.

Walter A. Zelnicker Supply Company, St. Louis, Mo., is mailing list No. 116 of new and second-hand rails, equipment and machinery which it has on hand for quick shipment.

Locke Insulator Manufacturing Company, Victor, N. Y., has issued a loose-catalog in which are listed and illustrated its various types of high-tension insulators, brackets, clamps and pins.

Hayes Track Appliance Company, Geneva, N. Y., has issued a pamphlet containing views of the Hayes derail as installed at various points on the lines of the Cincinnati Southern Railway.

Crocker-Wheeler Company, Ampere, N. J., has issued bulletin No. 123 in which it describes a line of field-weakening adjustable-speed motors. It contains many illustrations of actual applications to machine tools.

Burton W. Mudge & Company, Chicago, Ill., have issued a folder describing and illustrating the Garland car ventilator for interurban, street, elevated and subway cars with monitor deck, and high or low arched roofs.

Joseph Dixon Crucible Company, Jersey City, N. J., has issued a booklet in which attention is called to the merits of its Silica-Graphite paint. A number of views are included of structures, the steelwork of which is protected with Silica-Graphite paint.

L. J. Wing Manufacturing Company, New York, N. Y., has issued bulletin No. 8, describing and illustrating its type A motor-driven fan, type A belt-driven fan, skeleton fan, and Wing disk fan. The bulletin also contains dimension and rating tables for Wing disk fans, and price lists.

Under-Feed Stoker Company of America, Chicago, Ill., has issued the October number of the "Publicity Magazine," which is devoted to the interests of the Jones stoker. It contains a description of the Jones stoker and numerous illustrations showing some of the larger installations of this apparatus.

Speer Carbon Company, St. Marys, Pa., has issued a 22-page catalog in which are described its various grades of carbon brushes for different types of motors and generators. It also contains a number of curves in which are summarized the results of an elaborate series of tests of Speer carbon brushes. Several views of the company's laboratory are also shown.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has just made a distribution of sections for its perpetual catalogue No. 3001. There are 24 sections in the new distribution covering a wide range of topics. Among the apparatus described are meters, circuit breakers, arc lamp accessories, static protective apparatus, switchboards and series Tungsten street lighting systems.

Northwestern Expanded Metal Company, Chicago, Ill., is distributing a booklet which contains designing data for the use of expanded metal for reinforcing concrete culverts, sewers, bridges, tanks and walls. This booklet is a consolidation of its designing data pamphlets Nos. 7 and 8 and a part of No. 6, and supersedes all data on reinforced concrete culverts, sewers and bridges previously issued by the company.

Electric Storage Battery Company, Philadelphia, Pa., has issued bulletin No. 126, which is devoted to oil insulators used for insulating battery tanks, and bulletin No. 127, which briefly describes and illustrates some of the company's automatic regulating apparatus. The company has also issued bulletin No. 125, which describes the installations of the chloride accumulator on the system of the Gulfport & Mississippi Coast Traction Company.

American Steel & Wire Company, Chicago, Ill., has published a 234-page catalog and handbook entitled "Electrical Wires and Cables." It is conveniently and logically divided into nine sections, the first of which contains in descriptive and tabulated form general engineering data relating to copper, iron and aluminum electrical conductors. The following seven sections constitute the catalog portion of the book, in which is given, not only a complete list of all bare and insulated electrical wires and cables manufactured by the company, but also some general information regarding standard specifications and the uses and construction of conductors. The final section has been compiled with considerable care for use as a dictionary of electrical terms. The book concludes with a very complete index, having conveniently arranged cross references to materials used specially for electric light, electric railway and telephone and telegraph work.