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Advertising Interurbans

Advertising of electric railway lines has come to be accepted so much a matter of course by the more progressive companies that it would almost seem unnecessary to call attention to its importance. Whether it is because the summer tourist season has recently closed or whether there are still a number of roads that do not appreciate the importance of publicity we do not know, but for some reason there has been a remarkable laxity among some of the companies engaged in this traffic. The writer, arriving one day recently in a city of nearly 100,000, from which several interurbans radiate, sought by inquiry at the principal hotel and also at the place where tickets were advertised as on sale, to secure a timetable and map which would enable him intelligently to plan his day's work. At neither of these places nor anywhere else along the road, as far as could be ascertained, were any such timetables obtainable. Earlier in the season, when the roads were new, and the tourists more numerous, it was within the writer's knowledge that advertising timetables were plentiful, but the management seemed to have made the incorrect assumption that because the tourist season had closed and the road had been in operation for some time all possible patrons of the road were familiar with it, and that there was nothing more to do but stop hustling and complain of the poor traffic until spring. No steam road assumes that it is too generally known to need at least timetables for the information of the public. A certain proportion of the travel over every interurban road each day comes from people who are strangers in the locality, and who have no means, save by hit or miss inquiry, of knowing where a road can take them or at what time, or how long a certain trip will take, if timetables are not to be found at the places where they have a right to expect to find them. Some one about the office of an interurban line should be required to see that hotel racks, railroad depots and other public places, where one might expect a timetable, be kept constantly supplied, and should be held strictly responsible for the continuity of this service.

Safety Devices for Massachusetts Railways

Although the Massachusetts Railroad Commissioners have not yet finished the task assigned by the Legislature of investigating the necessity for improved safety appliances on street cars, their attitude toward the employment of power brakes is plainly indicated by their recent rulings. So far as the present investigation is concerned it is proposed to determine whether the power brake is superior to the hand brake as a safety device for street railways, what expense would be entailed by the operating companies in the equipment of their rolling stock with power brakes, and how much time would be required to equip the electric railways of the entire State with power brakes, should it be deemed necessary to enact a law making it obligatory upon the companies to do so.

Other subjects upon which the Commissioners are seeking information are the advisability and necessity of having all street railway cars equipped with jackscrews or other implements sufficient to raise the cars to such a height as will permit the extrication of injured persons held beneath them; and the efficiency of the fenders available for use on the street railway cars of the State. No expression of opinion has thus far been volunteered upon the proposal to make jackscrews a part of the car equipment, but there have been many advocates of fenders present at the meetings.

The Commissioners have already ordered several companies to place power brakes upon high-speed, double-track cars, intended for use over single-track lines, and there are indications that they favor a general application of this rule. At the public hearings very little interest has been shown in this feature of the investigation; in fact, it may be said that throughout the proceedings the only persons who have shown a desire to be heard are those advocating some form of apparatus which they desire to have adopted. It is promised that the street railway companies will be



permitted to present their views, and offer such suggestions as their experience may indicate to be desirable. The Commission will prepare a report upon this subject, which must be presented to the Legislature by June 15. This will form a comprehensive review of the development and application of safety devices to the operation of electric roads in Massachusetts, it is promised, and the operating companies are consequently interested in the present proceedings. In the first place it is desirable that the Commissioners be fully informed on the subject from the operating companies' view point, and, moreover, it is very important that the matter should be presented in the right light to the Legislature and the public.

### Chicago Franchise Ruling

The Supreme Court of Illinois has handed down two very important decisions affecting the street railway companies of Chicago, the first of which affirms the city's right to regulate fares and upholds the transfer ordinance, while the second establishes the right of the city to compel the companies to clean the roadway between the tracks and remove snow from the streets through which their lines pass. The first of these decisions is the result of litigation instituted by the city on behalf of suburbanites, who objected to paying two fares to reach their places of business. The second was the outcome of an attempt on the part of the city to recover the cost of removing snow which had been piled up along the tracks of the street railway in the companies' efforts to keep their lines open during severe snow storms.

On the question of the right to regulate fares, the decision says that an examination of the city charters of 1851, 1863 and 1872 reveals the fact that this power has been granted to the city. It is further declared to be the general doctrine that the Legislature has the right to regulate fares and charges of common carriers, and that the municipality may exercise that power by delegation from the State. On the question of a contract existing between the city and the street railway companies, the court holds that the corporations exercise their powers subject to municipal regulations, and that the enforcement of the transfer ordinance is not a violation of such a contract. This transfer ordinance calls for the conveyance of passengers any distance within the city limits for one fare, provided the line of cars is owned, leased or operated by the same firm, company or corporation, and this applied whether the lines are continuous, intersecting or come within 200 ft. of each other. It is not seriously contended by any one that this construction reveals the spirit of the law or is in harmony with the views of the legislators who enacted it. It must be admitted that when the lines extending into the present suburban districts were built, it was not understood by the companies or the property owners of these districts that the new railways were to be operated as a part of the old system or that a single fare would entitle a passenger to ride over both lines. Consequently, it will not be admitted by any unprejudiced observer that such a policy as that now proposed can be enforced in good faith against the wishes of the companies, yet the effect of the decision will be to make the Union Traction Company furnish transportation for one fare between all points in the immense territory which its lines serve. It will enable a passenger, for instance, to ride from the city limits on the North Side to the city limits on the West Side, or vice versa, for one fare, and he may go from Jefferson, Bowmanville or High Ridge to Lawndale or Austin for 5 cents. This, of course, introduces many complications into the operating problem of the Chicago railway properties, and adds an entirely new element to the franchise controversy. It would seem that the constitutional provision which assures corporations, as well as individuals, against confiscation of property without due process of law and fair compensation, would be flagrantly violated by the proposed policy of those who have conducted the litigation against the transportation interests.

The plea of the railroad companies that these long hauls and

transfers would make operation unprofitable is met with the statement that "a railroad company is not entitled to exact such charges for transportation as will enable it at all times not only to pay operating expenses, but to meet the interest regularly accruing upon all its outstanding obligations and justify a dividend upon all its stock." This ruling is based upon a decision of the Supreme Court of the United States (*San Diego Land & Town Company vs. National City*), where it was held that "if a railroad corporation has bonded its property to an extent that exceeds its fair value, or if its capitalization is largely fictitious, it may not impose upon the public the burden of such increased rates as may be required for the purpose of realizing profits upon such excessive valuation or fictitious capitalization." By taking this attitude the Illinois Supreme Court holds in effect that the traction companies must show that the securities upon which they have guaranteed interest charges, represent the actual value of the properties, and that if a fictitious valuation has been given these properties, the operating company is not warranted in charging a fare sufficiently large to pay the interest on these securities. We do not believe that this decision will be accepted outside the jurisdiction of the court which rendered it, or that it will be taken as a precedent by courts of equal jurisdiction; but it is, nevertheless, unfortunate that it should come at a time when a serious effort is being made to solve the transportation problem. It is feared that it will encourage Mayor Harrison and his followers, who will welcome this decision as political capital, and will now renew their efforts to prevent the operating companies and the transportation committee from reaching an agreement.

Regarding the question of cleaning the streets through which the companies' lines extend, it was held that the city could require the companies to keep that portion of the roadway between the tracks in proper condition at all times; moreover, in the winter, when the companies clear their tracks of snow, it was held that the city could compel them to remove the snow from the streets and dispose of it instead of piling it up along the sides of the track, and thus obstructing ordinary vehicular traffic.

### Promoters and Their Methods

The interest which has been manifested in the development of interurban railway properties and the willingness of farmers and merchants in small towns to lend financial assistance to these enterprises seems to have attracted to this field many irresponsible promoters and others who are entirely incompetent to carry out undertakings of this character. Accordingly, all sorts of schemes are being exploited, the localities selected for this work generally being in the neighborhood of some line that has already been established upon recognized standards by men of sufficient means to build and operate it properly, thus enabling the newcomers to profit by the good reputation of the original installation.

It is questionable whether many of the undertakings complained of are started in good faith and with the intention of completing them. On their face most of them seem to be merely pretenses for unloading worthless securities upon a gullible public, but some of the projects have merit, and if supported by competent men with sufficient capital to put them through, would doubtless develop into profitable investments, but the trouble is that they are promoted merely to be sold out or to be utilized by sharpers for issuing stock. This is evident from the tone and character of certain advertisements that have appeared lately in the newspapers throughout Ohio, especially those published in the smaller cities. An example is furnished by a construction company, which offers for sale securities of a proposed interurban road, to the amount of \$25,000, at \$10 a share, and as an inducement to purchasers announces that it "will give away on Jan. 1, 1903, \$1,000 worth of 6 per cent gold coupon bonds." With each share of stock the purchaser is promised a coupon that will entitle the holder to one chance in the drawing.

Of course, this is a very reprehensible method, and in many



States the promoters could be reached under the lottery law. Evidently they feel the necessity of offering some sort of an explanation of their course, for they say that they are "doing the construction work, and that they have taken a large block of stock in payment and desire to realize on a portion of it." It would seem, however, that they have no confidence in the project themselves or that they realize their inability to carry it through. Otherwise, they would not resort to such unusual methods in financing it. This, however, is not the first unusual procedure in connection with this property. Some time ago an effort was made to secure stock subscriptions along the route of the proposed line by holding out as an inducement an offer of employment on the road. It is greatly to be feared that such practice will bring trouble upon legitimate enterprises, as these operations are bound to reflect upon the industry and bring the interurban electric railway into disrepute wherever the people have suffered from the visitation of this class of promoters.

### Ill-Advised Activity

Several prominent labor unions in Boston have set on foot a movement to defeat the new Washington Street Subway bill, when it comes before the voters of that city at the next municipal election, on the ground that it contains no clause or section providing for the exclusive employment of union labor in the construction of the tunnel. This agitation is an evidence of such gross selfishness and utter want of public spirit that it is earnestly to be hoped that every sane and intelligent voter of the New England metropolis will vigorously repudiate the bold-faced attack upon individual liberty which is threatened, and declare, by no weak majority, that the right of any American citizen to work at terms agreed upon by himself and his employer shall be maintained inviolate.

The transportation facilities of Boston are in crying need of this subway in the heart of the business district, and if the construction is delayed another year, through the ill-advised activity of certain labor organizations, the public will indeed suffer great inconvenience. The subway bill, as now drawn, has passed both Houses of the Massachusetts Legislature, received the governor's signature, has been approved by the representatives of the city of Boston, its commercial organizations and the Boston Elevated Railway Company, and simply awaits the consent of the voters in referendum enactment to become law. Preliminary studies and surveys have already been made by the Boston Transit Commission, and it is the general consensus of opinion in that city that the bill, as it now stands, represents the most generally equitable and harmonious compromise of the heretofore conflicting interests that can readily be made.

If the bill should be defeated, the first result would undoubtedly be a loss to the labor unions in general prestige that can scarcely be measured. Few communities in the East are in any intellectual temper to stand, without vigorous protest, any further inconvenience and loss resulting from either labor union tyranny or overbearing corporate greed, after the experience drawn from the recent anthracite coal strike. Personal liberty is no where in the United States held dearer than in Boston, and the history of the overthrow of tyranny in the past in New England ought to be warning that the public spirit of 1902 contains enough of the old fire and indomitable energy to make Boston an inhospitable home for any sort of anarchy. Public sentiment is a factor which neither labor union nor corporation can hereafter safely overlook or defy, with the inference of the coal strike of 1902 behind it. Without popular sympathy a labor union or any combination of unions is bound ultimately to writhe in its death throes, for this country is still in the hands of its voters, who never will yield the individual freedom to work in their own time and way as long as the spirit which founded this republic is to be found alive.

The second result of the failure of the bill's passage would undoubtedly be a continuance and aggravation of the already burdensome and congested conditions of transportation which to-day

exist in the main business thoroughfares of the city. For several years there has been a growing necessity of a further avenue of rapid transit travel in the business heart of Boston, from north to south, and in the reverse direction. Boylston Street, in the Back Bay, is already presenting still further problems of severe congestion in busy hours, and awaits further action by those in authority, as soon as the Washington Street subway can be well started, if not even before its completion. No keen observer of modern methods of transportation can fail to see the immediate necessity of relief in the present congested districts, and the attempt of irresponsible labor unions to block the progress of this great public work, and necessity must be met with an avalanche of opposition if a great public wrong is to be averted.

The third result may easily be a bill of far less satisfaction to labor than the present one. It is impossible to foresee the character of legislation which would be enacted next year, in view of the possible changes in political outlook and legislative personnel which this week's elections may bring. For the labor unions to interfere successfully to prevent the passage of the Washington Street Subway bill of 1902 would be for them to strike a blow which would react hardest upon their own heads, and it is inconceivable that the intelligent thinking citizens of Boston, whether union or non-union sympathizers, will commit an act of such monumental and mischief-making folly as to oppose the passage of a bill, which if made law will result in a general good beyond the power of these brief comments to tell.

### Reckless Automobile Driving

Conviction and punishment are being meted out to reckless automobile operators nowadays in a manner that is liable to strike terror into the hearts of some of the young scalawags who have been scorching through crowded city thoroughfares and quiet residence districts with no more compunction than if they were on a race course. Six months' imprisonment in the Kings County Penitentiary was the sentence pronounced last week by City Judge Kellogg, at White Plains, upon W. Byrd Raymond, the driver who was arrested in connection with the collision between a trolley car and an automobile in Warburton Avenue, Yonkers, on Oct. 26. The accident caused injury to twenty-two persons who were in the car.

In announcing his decision the court took occasion to point out the reprehensible character of the prisoner's conduct in putting the lives of others in needless peril. The judge said that he had no prejudice against automobiles or bicycles in general, but the owners of these machines must understand that the general public had rights which they were bound to respect. There is no inclination on the part of the public to hamper or restrict the proper enjoyment of the automobile or its utilization in commercial service, but there is a well-defined antipathy to the shallow-pated youngster who delights in doing "stunts" similar to those performed by Raymond at Yonkers in darting across the railway tracks in front of a trolley car.

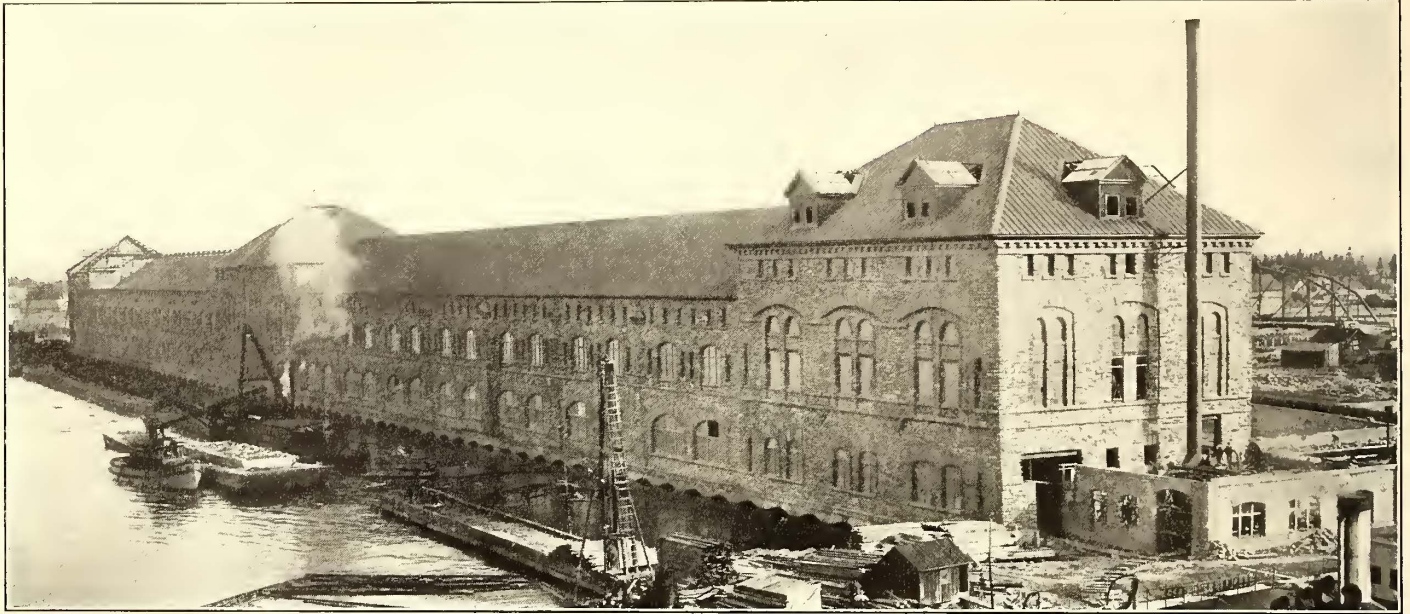
The courts of other States have been equally severe in dealing with cases of this kind, whenever it was apparent that the accidents under investigation were the result of criminal negligence or carelessness. Last week one conviction of an operator, on the charge of manslaughter, was secured, and a sentence of one year imposed. This should prove a salutary lesson to those who find a peculiar satisfaction in "taking chances" in scorching through city streets. In the rural districts there have been many arrests during the last year, and in some localities farmers have organized societies to enforce the speed limitations imposed by local ordinances. On several occasions these committees have been on the verge of becoming vigilance societies for the time being, especially at resorts frequented by the fashionable set, who simply ignored the local regulations and turned the country roads into racing courses. The elimination of this class of operators will do much toward advancing the interests of legitimate sport and the development of the automobile industry.



## Opening of the American Soo Water Power Plant and Electric Railway

A water power plant, second only to that of Niagara in capacity, has been under construction for four years at Sault Ste. Marie, Mich., and on Oct. 25 formal ceremonies were held, celebrating the completion of the hydraulic part of the work. Little of the electrical machinery of the plant has, as yet, been put in, but the entire output will be in the form of electrical energy, which will be utilized for various purposes in the immediate vicinity. This development is surpassed in this country only by that at Niagara. The rapids of Ste. Marie River, however, are farther from the market for power and in a sparsely populated portion of the country, but it is believed that the utilization of the great water

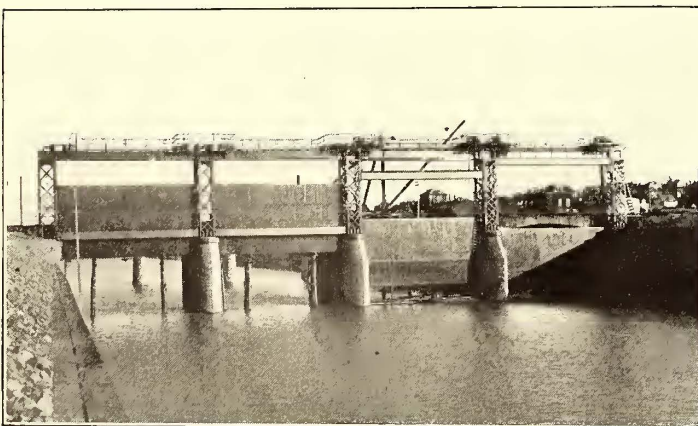
Country Club, east of town, to Fort Brady and the railroad terminal yards, west of the town, passing the Union Depot and all the main points of interest about the place. The construction work has been done by the Falk Company, of Milwaukee, which built the entire track and overhead line. The rails are 80-lb. standard T, and were rolled just across the river in Sault Ste. Marie, Ont., by the Algoma Steel Company, which is one of the industries controlled by the Consolidated Lake Superior Company. The overhead fittings were supplied by the Ohio Brass Company. Six semi-convertible cars have been ordered from the St. Louis Car Company, which are to be equipped with Westinghouse No. 49 motors, Providence style C fenders and electric heaters, made by the Consolidated Car Heating Company. As there is a large amount of snow at the "Soo" an ample snow equipment has been ordered, consisting of a plow, made by the



POWER HOUSE AT SAULT STE. MARIE, MICH.

power available here will go far toward attracting industries to this locality and will assist materially in the development of the region. Unlike the Niagara plant, which already had a market for its product, the Soo plant will be obliged to develop industries for that section and offer such inducements in the way of cheap power as will attract manufacturing establishments to that point.

The capacity of the plant is 32,000 kw, in 80 units of 400 kw each. One of the uses to be made of this electric power is the operation of an electric railway in Sault Ste. Marie, Mich. The water power development has been carried on by the Michigan Lake Superior Power Company. The electric railway has been



CONTROLLING GATES AT HEAD OF CANAL

built by the Trans-St. Mary's Traction Company. Both of these enterprises are carried on by the Consolidated Lake Superior Company at the Soo, on both American and Canadian sides. The active spirit in all of these enterprises is Francis H. Clergue, who is backed by Philadelphia capitalists.

The Trans-St. Mary's Traction Company has built a line along the principal street, near the river front, extending from the

Taunton Locomotive Manufacturing Company, and a McGuire sweeper.

A feature of the celebration was the operation of a special car over the line, very handsomely decorated for the occasion. The railway company had been unable to secure any of its own cars for this event, owing to the pressure of business at the works at which its rolling stock was being built, and it had been unable to borrow or rent a car from any other builder, as all the shops were behind in their orders. Finally an appeal was made by G. W. Chance, chief engineer of the company, to Thomas Lowry, president of the Twin City Rapid Transit Company, of Minneapolis, who is also president of the Minneapolis, St. Paul & Sault Ste. Marie Railway, and he at once came to the relief of the "Soo" company. Very careful preparations were required, however, to ensure delivery in time. The cars of the Twin City Company are 42 ft. long, and as the flat cars are only 34 ft. long, it was found necessary to utilize two of them for the car body and another for the trucks. Arrangements were made and orders were at once given by Mr. Lowry to load the car, and railroad officials were notified all along the line to rush this train through. It went through on a special mixed passenger and freight train, running on passenger time most of the way, and arrived at the Soo at 4:40 the next afternoon. The same night the train was switched over to the Algoma Iron Works on the Canadian Soo, and unloaded. The car was mounted on its trucks, the electric connections made, and the car returned to the American Soo on its own trucks across the International Bridge and transferred to the Traction Company's tracks early next morning. Decorators were immediately put to work on the car, and it was ready for running before noon.

The Twin City Rapid Transit Company also sent two experienced men, Mr. Lamb and Mr. Blanchard, along with the car from Minneapolis, who, together with the forces of the railway company, arranged all the details as to mounting the car and getting it in service and operating it.

The Trans-St. Mary's Traction Company was thus enabled to present to the citizens of the Soo, for their inspection and use, one of the finest cars built in the United States. The car is 42 ft. long, will seat fifty-one people, has four General Electric 67-motors, K-6 controller, hot-water heating, and is thoroughly modern in all its fittings, having just been turned out by the Twin

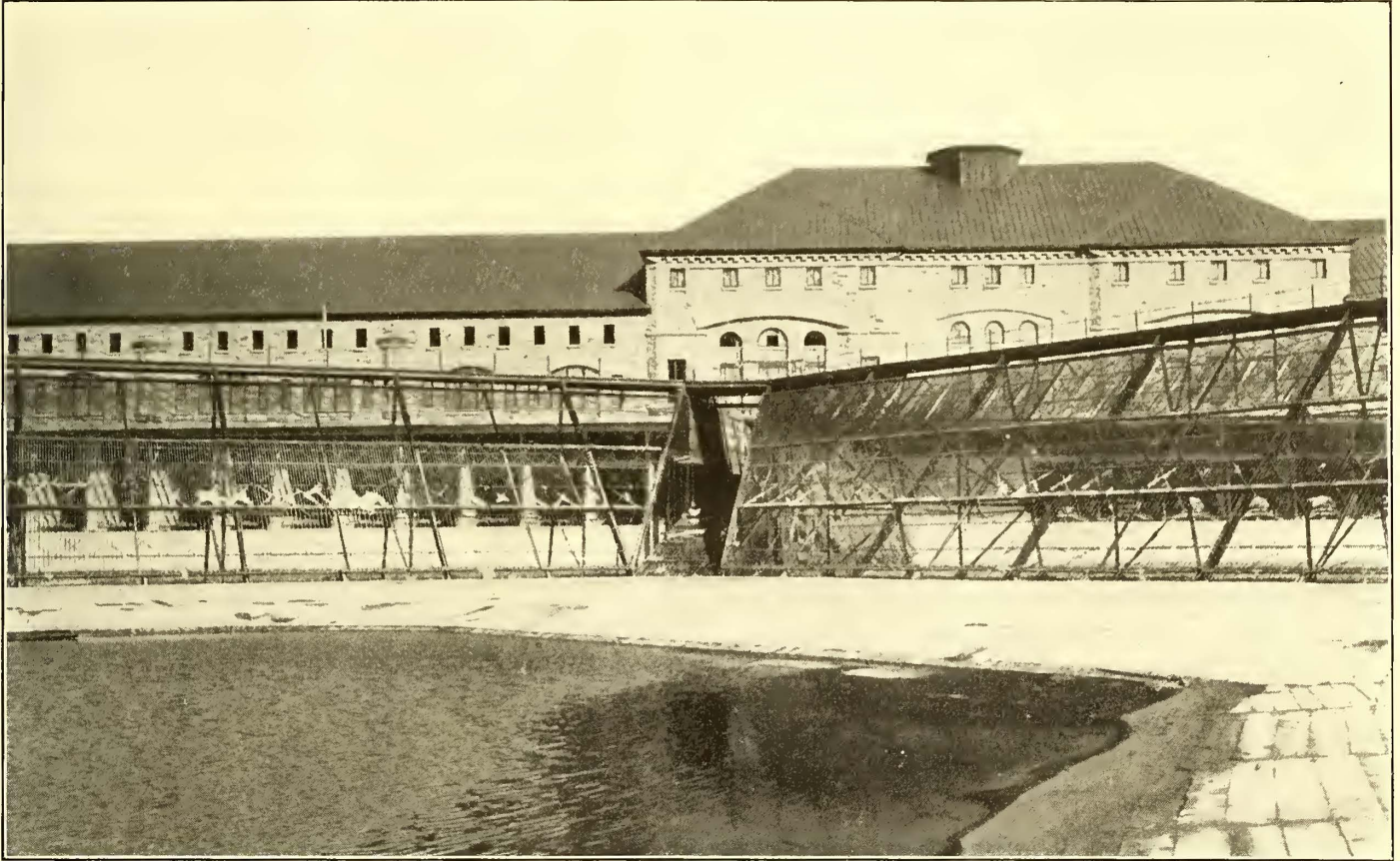


City Rapid Transit Company at its shops in Minneapolis, and never having been in service—except on its trial trip—before being sent to the Soo.

The car was very handsomely decorated on the outside and inside with red and orange bunting, in addition to the stars and stripes festooned on the inside of the car. The interior was also decorated with handsome photographs, showing the several stages of development of the canal and power house, in addition to a beautiful brochure gotten up by the Consolidated Lake Superior Power Company, showing views of the industrial establishments around the Soo, and the magnificent scenery along the Algoma Central & Hudson Bay Railway.

The first trip that the electric car made on Oct. 25 was to take a party of the directors of the Consolidated Lake Superior Power Company and invited guests from the power house to the Country Club, at a little after 4 o'clock. F. H. Clergue, president of the Trans-St. Mary's Traction Company, made a very appropriate address at the end of the line, calling attention to the vast resources of the Soo, and also to some local improvements con-

important features of the plant. The turbine used is of special design. Each unit consists of four water-wheels, placed on a horizontal shaft, which extends through a water-tight joint in the bulkhead into the generating room, which is on the down-stream side of the power house. The turbine ordinarily lies submerged in water, and when in operation the four wheels discharge into one short central draft tube. The gates for starting and stopping the wheels and for governing are located around the periphery of each turbine wheel. The specifications called for a unit that would develop 568 hp from 391 cu. ft. of water per second, under 16 ft. head, with a turbine speed of 180 r. p. m., and show an efficiency of 80 per cent from three-quarter to full gate. The turbines installed were tested in pairs on a horizontal shaft in the flume of the Holyoke Water Power Company before being installed at the Soo plant, and the maximum readings shown were 292 hp and 84 per cent efficiency at a speed of 180 r. p. m. under 16-ft. head, aggregating 584 hp at a minimum of 82 per cent efficiency from three-quarters to full gate for the penstock unit. Lombard water-wheel governors will be used, and to obtain syn-



ICE RACKS FROM BOTTOM OF FOREBAY

templated. On the return of the directors and invited guests to the power house, the public was given a general invitation to ride, and the car made a number of trips and carried many people.

Some idea of the magnitude of the present undertaking will be gained from an examination of the accompanying cuts and consideration of the fact that the length of the canal from Lake Superior to the power house on the Ste. Marie River is over 1300 ft., and that the width is 200 ft. There is an average depth of water in this canal of 23 ft., and the bed is through solid rock. Views of the forebay, showing the ice racks, and of the canal head-gates are also presented.

The length of the dam and power house combined, shown in the cut of the latter, is 1368 ft. In this power house, as already mentioned, provision is made for eighty generating units of 400 kw capacity each, to be operated by turbines under a head of 17 ft. to 21 ft. Right of way, 400 ft. wide, was purchased through the town for the canal, and the lower end of the canal, fronting on the river is the power house, which also serves the purpose of a dam. This arrangement enables the turbines in the station to discharge directly into the river. Water-wheels have been installed in half of the wheel pits, and four electric generators have already been furnished. The Stanley Electric Manufacturing company is furnishing the electrical apparatus, and the water-wheels are made by the Webster, Camp & Lane Company, of Akron, Ohio.

The hydraulic equipment forms one of the most interesting and

chronism, electric motors controlled at the switchboard will be employed. The electrical equipment will be supplied by the Stanley Electric Manufacturing Company, and will consist of three-phase 2300-volt 30-cycle alternators, three of which have already been installed. One 60-cycle Westinghouse alternator is also employed. The output for the use of the electric railway will be stepped down to 365 volts, by means of Stanley transformers into 600-volt direct-current by Stanley rotary converters. The line has been built under the supervision of G. W. Chance, chief engineer of the Trans-St. Mary's Traction Company.

### Tunnel Franchise Accepted

The formal acceptance of the revised franchise for the Pennsylvania Tunnel, granted by the Rapid Transit Commission three weeks ago, was received on Wednesday, Nov. 5, by the Commission from the directors of the Pennsylvania Railroad. The company's delay in returning the franchise was due to the fact that the Aldermen announced some time ago that they would not act upon it until after election. The franchise will now be forwarded to the Aldermen, but nearly a month will pass before a vote is taken on it. The Merchants' Association, of New York, has sent to merchants and manufacturers in Manhattan a circular urging them to petition the Board of Aldermen, according to blanks inclosed, to pass the Pennsylvania Tunnel franchise.



### A 10,000-Volt Railway Motor

In anticipation of the renewal of the tests in high-speed high-pressure electric railway work, near Berlin, Siemens & Halske have been conducting some independent experimental work and

car by omitting the intermediary transformers and utilizing a smaller motor. The old car weighed 96 tons, and the new equipment on a similar car carrying the same number of passengers, will not exceed 76 tons, while the power required will be cut down from 1000 hp to 920 hp.

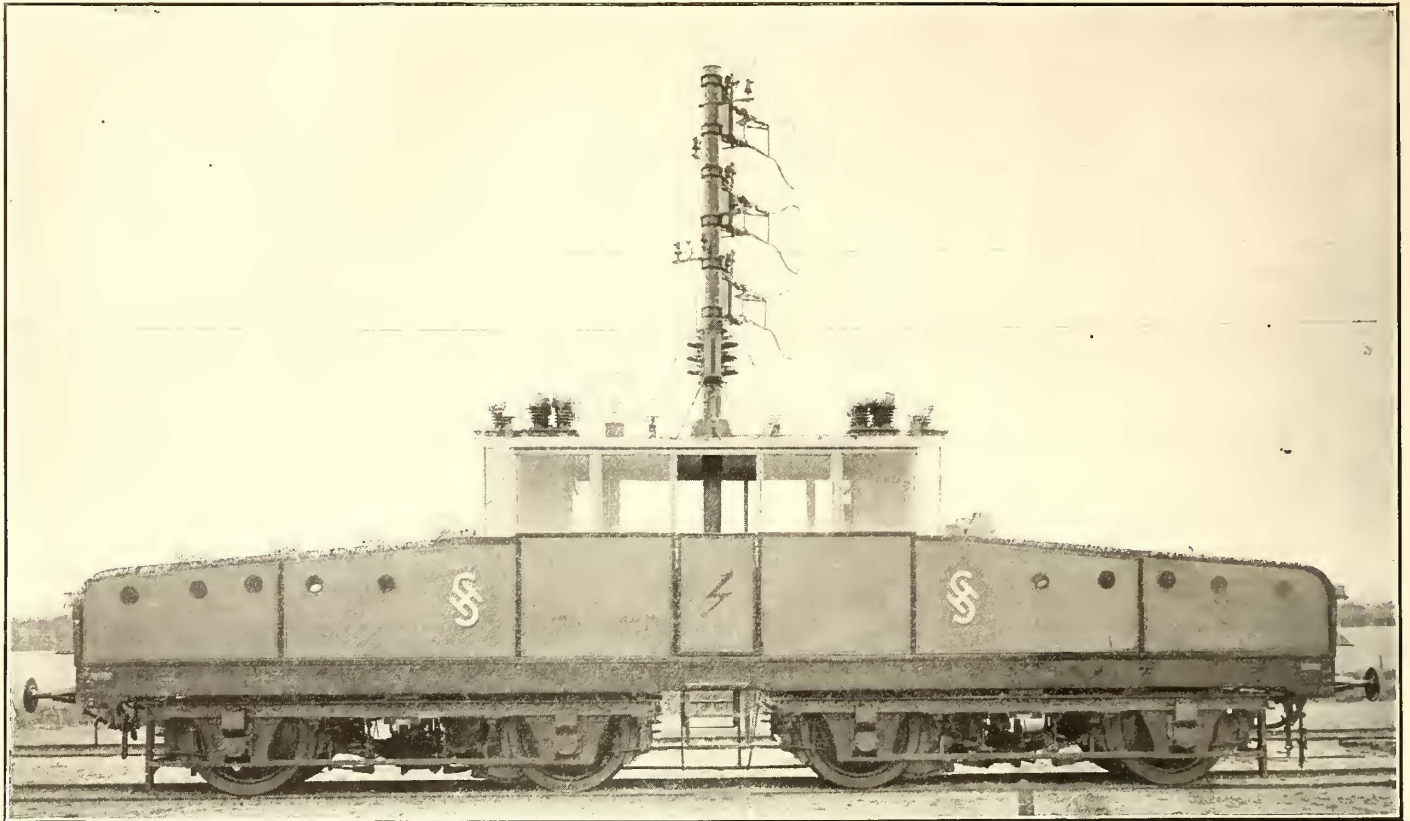


FIG. 1.—ELECTRIC LOCOMOTIVE EQUIPPED WITH MOTORS TAKING CURRENT AT 10,000 VOLTS

have built for this purpose an electric locomotive, which is illustrated in Fig. 1. In the original Zossen tests the line pressure of 10,000 volts was reduced by transformers before it reached the

The following description of this equipment is taken from a translation published in the London Electrician of a paper on the subject by Walter Reichel, and the cuts are reproduced from the same source.

The locomotive is built entirely of iron, of standard gage and conforming in all essential features to the requirements of the Prussian State Railways. The underframe is of the double-truck construction, the axles and axle-boxes being similar to those of the previous experimental car.

The wheels have a diameter of 1250 mm, and the wheel base of each bogey is  $3\frac{1}{4}$  m. Although only fitted with one motor each at present, there is room on each bogey for two. Fig. 2 shows the general arrangement of the locomotive with a pair of motors on each bogey.

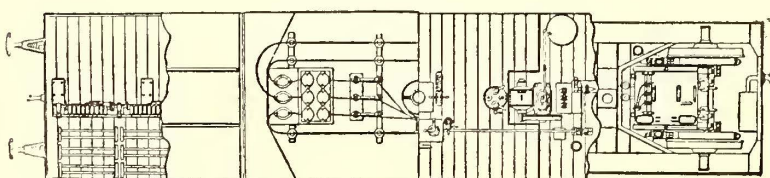
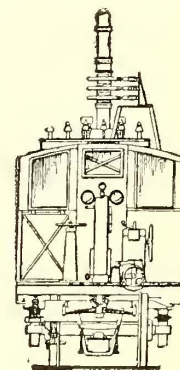
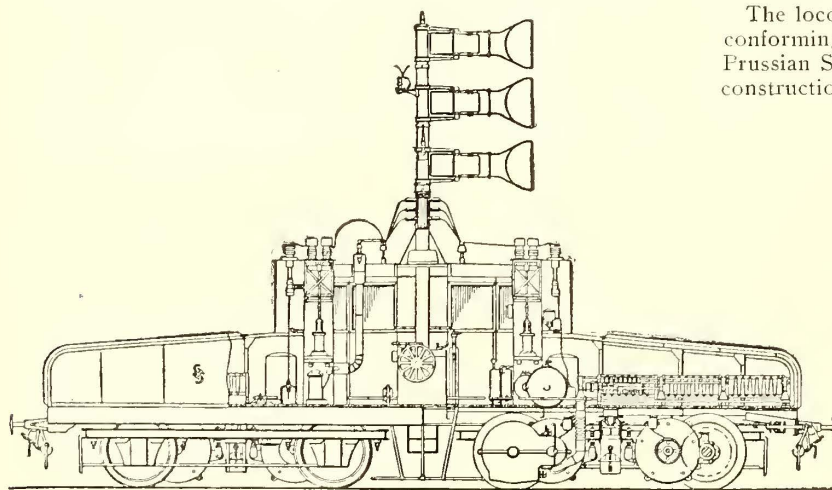


FIG. 2.—SIDE ELEVATION, END SECTION AND PLAN OF ELECTRIC LOCOMOTIVE

motors, but in the new equipment provision is made for taking current directly from the line at this voltage. One advantage in this arrangement will be the reduction effected in the weight of the

The details of the motor, which was designed by Herr Reichel, chief engineer for Siemens & Halske, are closely similar to those of motors for narrow gage. It is necessary to make the utmost use of the space between the wheels, and the bearings are, therefore, placed within the space enclosed by the motor windings, as shown in Fig. 3. In order to keep the pressure on the two bearings equal, the motor shaft is geared at each end to the car axle, there being a narrow spur wheel at each end of the motor shaft instead of a wider one at one side only. Another reason for this arrangement is that not only the pressure on the teeth, but also the velocity of the teeth is exceptionally great. The latter amounts to about 18 m per second, with 147 teeth in the larger wheel and 69 teeth in the smaller wheel.

Before adopting a system of lubrication, a number of experiments were tried with tooth velocities of 25 m per second, and it was found that it was not sufficient to fill the gear box with oil or consistent grease and let the gear run in it. For this reason



the system of forced lubrication with compressed air, shown in Fig. 4, was then adopted. By means of a pump a pressure of air corresponding to 5 cm of mercury is produced in the oil reservoir. This drives the oil out of the reservoir to a distributing cock, which must be turned to the right or left, depending on whether the locomotive is to be run forward or backward. The oil flows through one of two sets of pipes to the nozzles above or below the toothed wheel, as shown in Fig. 5, and after it has been used it

the primary winding of the motor was on the rotor, but this is only feasible with bar winding, which is not applicable in this case owing to the high pressure. It was not necessary to construct the present motor for a very high turning moment, as, in conse-

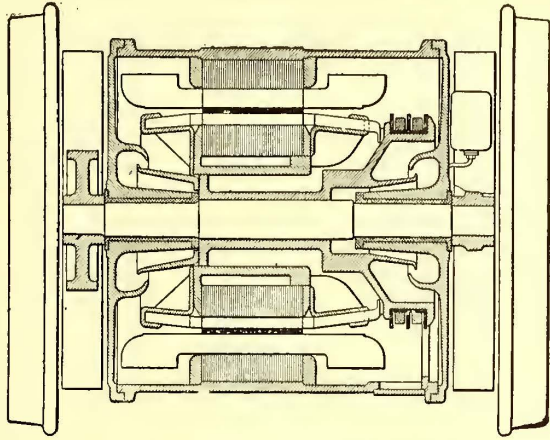


FIG. 3.—SECTIONAL VIEW OF MOTOR □

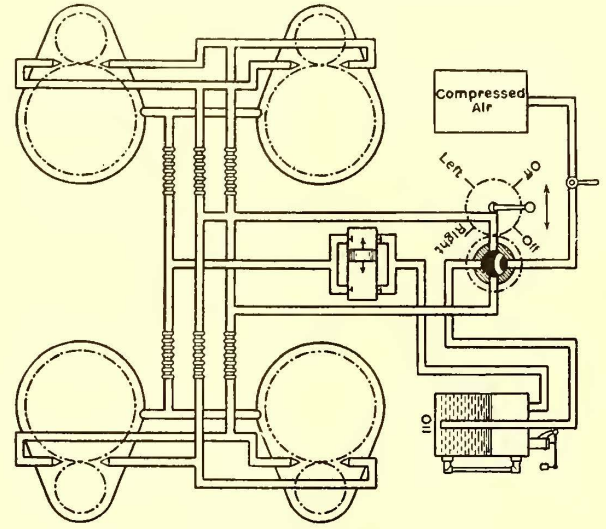


FIG. 4.—SYSTEM OF LUBRICATION

collects at the bottom of the gear case, and is then pumped back to the oil reservoir. This system of lubrication is only necessary with a gear ratio of 2.1. If a ratio of from 1.35 to 1.4 is used, the velocities of the teeth are smaller, and the ordinary lubrication with consistent grease is sufficient, otherwise the construction of the gear box is not different from the ordinary, nor is the suspension of the motor.

The motor case is of cast steel, and is made in two parts, carefully turned inside so that there is a firm bearing surface for the active iron and a good conduction of heat through it. The bushes of the bearing are in one part. They are of bronze, lined with white metal, 300 mm long and 100 mm internal diameter. This makes it possible to reduce the air-gap of the motor to 1.5 mm or 2 mm. The active iron which carries the primary winding is fastened with screws into the motor case, which is shown in Fig. 6. The rotor of the motor is fastened to the motor shaft by means of a special sleeve, so that the motor can subsequently be arranged on the car axle for direct driving. The active iron of the rotor is held together by screws and pressure discs, and carries the secondary winding. On the rotor sleeve two slip rings are held by a second sleeve, and the current is collected from the slip rings by means of carbon brushes. There are three apertures in the upper casting

quence of the smaller weight of the car, smaller starting torque was necessary. The rotor may, therefore, be of smaller diameter, and the primary winding can be placed on the stator. In order to afford as large a cooling surface as possible, the slots are made fairly deep, so that the coils are thin and wide. A calculation of the conditions of saturation of the active iron gave a radius of about 34 cm for a width of 30 cm. The cores of both stator and rotor consist of laminations, those for the rotor being stamped in one piece, and those for the stator being made up of segments. The calculation for the winding gave 72 open slots, and 72 wires per slot of the primary. Star connection is employed, and the wires are placed in mica tubes. To save space and to secure certainty of insulation the coils are placed alternately in longer and shorter tubes, so that the longer ends always lap over the shorter. By this means the possibility of sparking from one phase to another is considerably reduced. The method of insulating the high-pressure winding was determined upon after several trials. In the final test the winding withstood a pressure of 22,000 volts without cracking and without disclosing any weakness.

The winding of the rotor is placed in ninety half-closed slots, and consists of a number of single flat copper bars arranged in series and four in each slot. It is a wave winding connected in

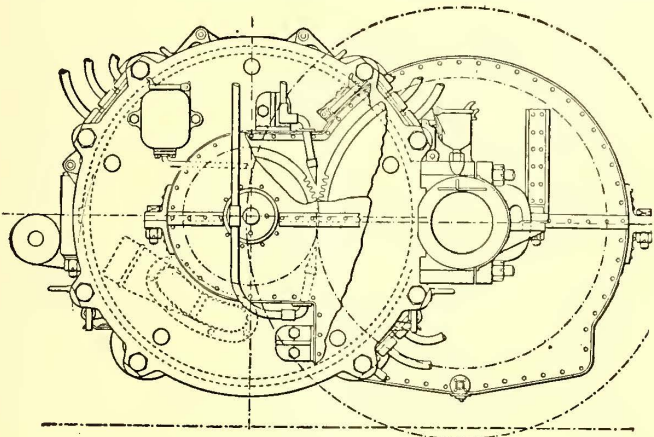


FIG. 5.—ELEVATION OF MOTOR AND GEAR CASE, SHOWING METHOD OF LUBRICATION

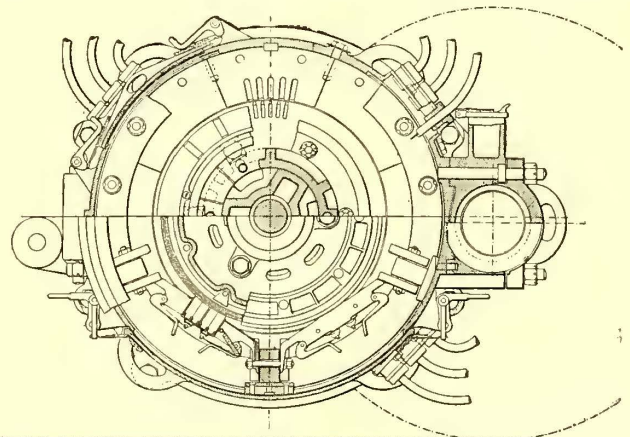


FIG. 6.—SECTIONAL ELEVATION OF MOTOR

of the motor case on the slip-ring side, to facilitate inspection. The motor itself is lubricated by means of oil and wicks, the oil being contained in vessels screwed on to the motor and communicating with the bearings by copper tubes, which are shown in Fig. 5. This arrangement was found to be necessary because of the small space available.

To obtain a better casting the axle bearings are screwed on to the motor casing, Fig. 6. On the other hand, the lugs which, with the assistance of the springs, transfer the weight of the motors and the turning movement it occasions to the underframe, are cast directly on to the motor casing.

In the first experimental fast-speed car, it will be remembered,

star. The three free ends are connected to two slip rings and the frame of the rotor respectively. At starting the pressure in the rotor winding is 700 volts. The employment of bars for the rotor winding facilitates the addition of bronze binding wires, and also permits of a very effective ventilation. The air enters the neighborhood of the shaft and is directed outward through the openings in the rotor casting by vanes, which are cast on to the latter. This current of air also cools the stator coils. The velocity of the air was about 6 m per second, and about 120 litres of air was forced through per second. To prevent the high pressure sparking over when the motor gets warm, the inside of the frame is covered with a thick layer of mica wherever it is adjacent to the



primary winding, and the distance of this winding from the frame is always kept as large as possible.

The three high-pressure cables, which are insulated to stand 15,000 volts, are led through three soft rubber brushes, which are placed inside hard rubber brushes. They end in three terminals, which are mounted on corrugated porcelain insulators attached to saddles supported on mica-insulated iron tubes fixed to the casing of the motor. The weight of the motor and gear is 4090 kg.

Fig. 7 shows the connections of the motor and controller. With the exception of the resistances, nearly all the apparatus employed are similar to those used in the previous experimental car. The speed at starting is regulated by varying the resistance in the rotor

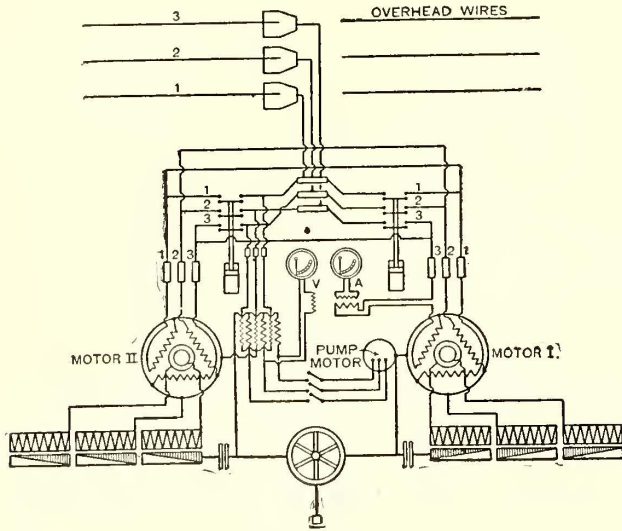


FIG. 7.—GENERAL DIAGRAM OF CONNECTIONS

or secondary circuit. This is insulated from earth, as the third secondary phase of the motor is connected to earth through the motor shaft. The current to the stator coils passes from the main switch through fuses. The switch is driven by an air piston, and serves as a reversing switch by changing the phases.

The rotor resistance has twenty-four steps, and the resistance coils are spirals of Krupp wire, held by porcelain insulators on an iron frame. The hand-wheel is on a vertical spindle which controls this resistance. The switches for the primary high-pressure circuit are of the tubular type, and are worked by air pressure. Both the high-pressure switches and fuses are placed in the cable ways behind the motors, and are visible through glass windows.

When the locomotive was completed tests were made at a gradually increasing pressure, starting at 6000 volts and about 50 alternations. The final test was made at 11000 volts and 95 alternations, and with a trailer weighing 31 tons, a speed of 105 km per hour was attained. The toothed gear ran quietly, and the motor stood the high pressure. About 260 kw were required. This corresponds to a load of about 280 hp on the driving wheels, which agrees with experience already obtained at 100 kw per hour. Tests were also made to determine the tractive effort of the locomotive, and for this purpose the old experimental car was used as trailer, so that a total weight of about 130 tons was drawn.

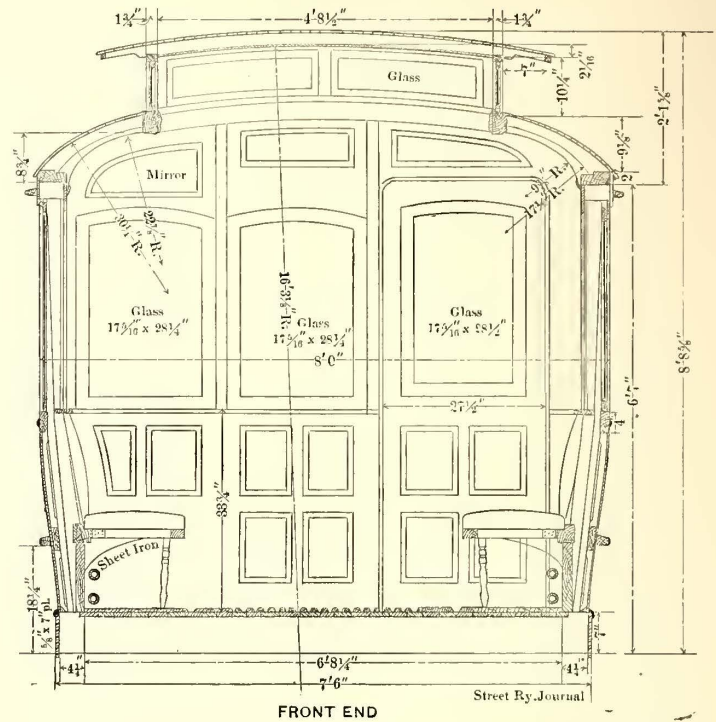
**Brownell Plant Acquired by the Brill Company for the American Car Company**

It was announced in St. Louis this week that the Brownell Car Works had recently been acquired by the American Car & Truck Company. This latter company was formerly the American Car Company, which has been reorganized and reincorporated under the new name, and at a recent meeting John A. Brill was elected president of the new company. This deal will give the Brill Company control of two large and complete car building plants west of the Mississippi River.

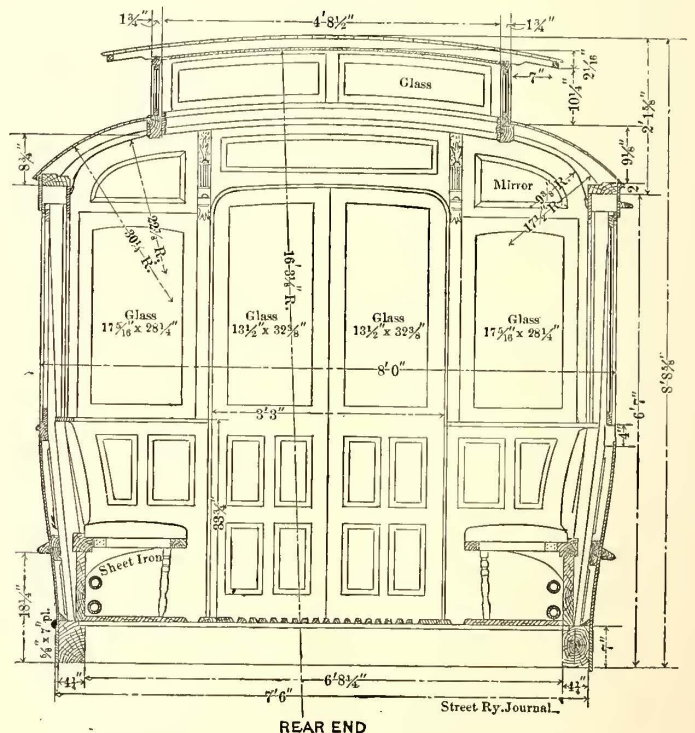
The Brownell car works, of which the late F. B. Brownell was the head, are in North St. Louis. When, some years ago, the firm became financially involved to such an extent that the appointment of a trustee was necessary, W. B. Thompson, a director of the company, was appointed to that position, and has handled the property ever since. At the time it came into his hands, it is stated, there was \$190,000 of indebtedness against it. Mr. Thompson has so handled it that the property has not only paid off the total indebtedness, but has given a handsome income for Mrs. Brownell and her daughter.

**New Cars for the Cincinnati Traction Company**

For a long time single-truck cars have been used exclusively on city lines in Cincinnati. The present management, however, has seen fit to follow the example of many other companies throughout the United States, and has begun to equip with double-truck



FRONT END



REAR END

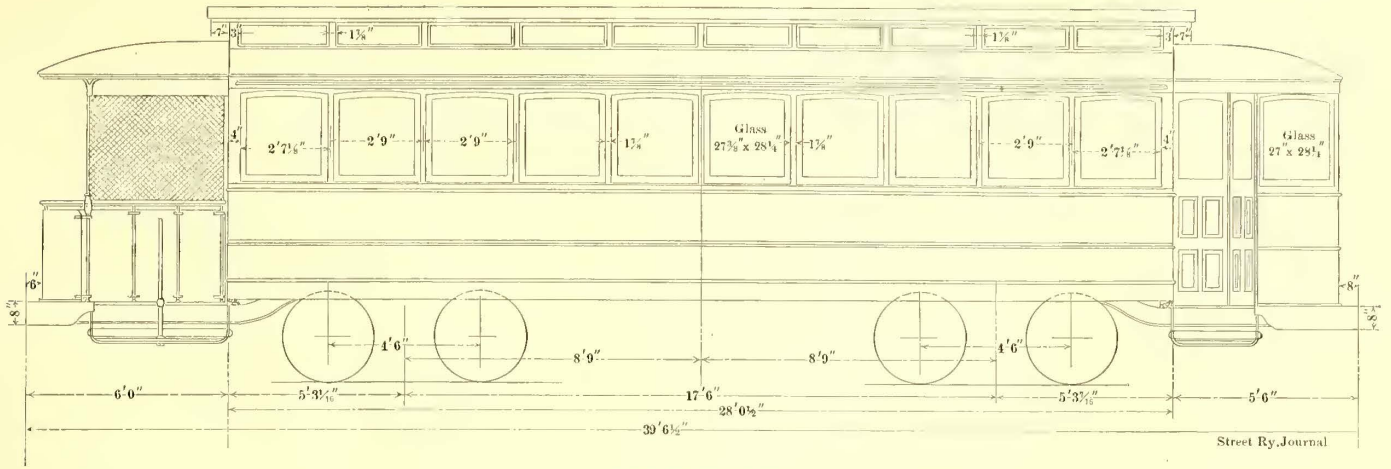
**CROSS SECTIONS OF STANDARD CLOSED CARS**

cars. The drawings showing the construction of these cars are given accompanying this article.

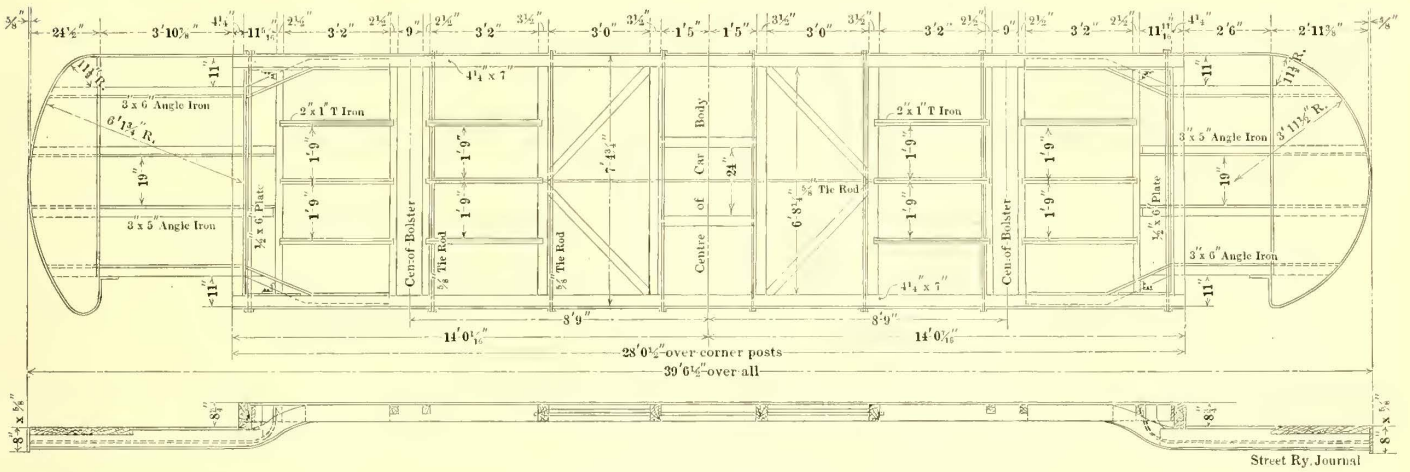
The length of the new car is 39 ft. 6 1/2 ins. over all. The length of the body is 28 ft. 1/2 in. over corner posts. The trucks upon which these cars are mounted are Peckham 14B 3, extra heavy, with 4 ft. 6-in. wheel base. The distance between truck centers is 17 ft. 6 ins.

These cars will run single-ended, as can be seen by the platform arrangement, which gives the motorman a cab by himself, free from all interference by passengers. The cars will be equipped

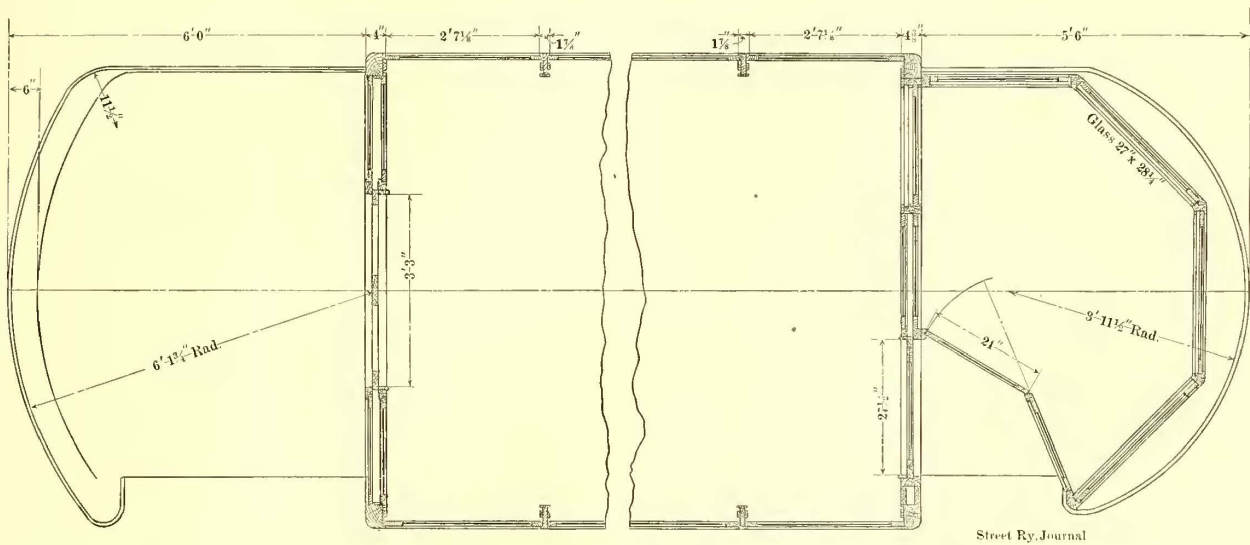




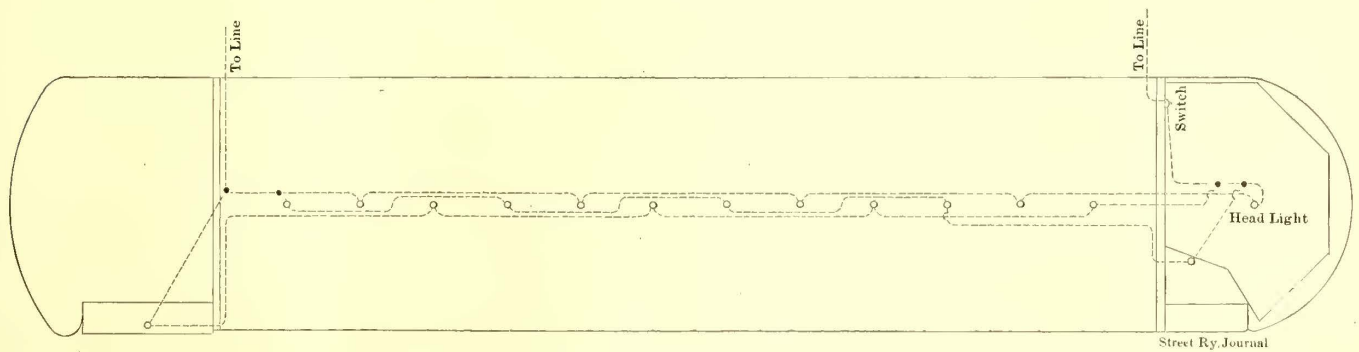
SIDE ELEVATION



FLOOR FRAMING



PLATFORMS



PLAN OF WIRING CARS



with Westinghouse number 68 motors, two motors on each truck. These cars are being built at the Cincinnati Traction Company's large shops in Cincinnati, where such an extensive plant for car building has been erected that the company has seen fit to take a number of contracts for cars from other street railway companies in order to make it profitable to keep these shops in operation. The shops are under the charge of Robert Dunning, master mechanic, who, with President and General Manager W. Kelsey Schoepf, decided upon the design of the cars now being built.

### New England Street Railway Club

The first fall meeting of the New England Street Railway Club was held at Wesleyan Hall, 36 Bromfield Street, Boston, on Thursday evening, Oct. 23, with President Farrington in the chair. The subject for discussion was the "Multiple Unit System," and the meeting began with a paper upon this topic by Paul Winsor, assistant to the vice-president of the Boston Elevated Railway Company.

In speaking of multiple unit control Mr. Winsor stated his desire to cover the subject broadly, and referred to the definition given by F. J. Sprague, in the May 4, 1901, issue of the STREET RAILWAY JOURNAL, as follows: "Briefly defined it is a system of control of railway motor controllers, whatever their number, and wherever situated in a train, through a secondary electric circuit, common to all the cars from or through which it is desired to exercise control. The number and position of equipped or unequipped units, and to a certain extent the character of these units, is immaterial, and variation in end relation should likewise be a matter of indifference." Mr. Winsor then said in part:

"Nearly all the members of this club are single-car men, and few roads in the East, operated by electricity, are using more than one car per train. In cities where rapid transit service is a necessity in congested districts at high speed it becomes very necessary to use more than one car in a train in order to handle the traffic properly, especially as the time interval between high-speed cars must be considerably greater than that between slower speed equipments. It is now about two years since an exhaustive series of tests were made at night in the Tremont Street subway by the Boston Elevated Railway Company on the different types of multiple unit control then on the market. Trains were run back and forth, the power consumption of the equipments measured, and after a careful analysis of the results the Sprague system was adopted by the company as the one apparently best suited to its requirements. The systems tested were the Sprague, Westinghouse and General Electric. As is well known the Sprague Company now is controlled by the Sprague Company, and I understand that there is some arrangement between the Westinghouse and General Electric Companies whereby patent litigation is avoided when the two types of controls come into competition. I believe that the electric railway world owes more to Frank J. Sprague in connection with the multiple unit system than to any other man, and it owes much to him in view of his earlier pioneer work in surface car practice as well. Not only is he a tremendous enthusiast himself, but as he has the power of making others enthusiastic, and it is largely due to his persistent efforts that the control of to-day is in its present practical form.

"All three systems have master controllers on the car platforms, connected by cables to the control system proper. The Sprague and General Electric controllers resemble closely the ordinary platform street car controller, but the Westinghouse master controller is slightly different in its outward form, but essentially similar in its operating features. In general the Westinghouse system is the simplest of the three. It involves no new or untried devices, and all the apparatus which goes to make it up has been used for years in other service. The main controllers are usually placed in a closet on each motor car. One air cylinder moves the reverser around, and another operates the main controller drum, which makes the series parallel combinations of motors which are found in ordinary work. The power for moving the control cylinders is derived from compressed air supplied by the air-brake system, and the air valves are opened and closed by small electromagnets, actuated by a small battery current.

"The first movement throws the reversers forward or back, the second operates the air cylinder of the car circuit breaker, closing a rather quick break switch by air pressure, and the third master control movement connects to the controller drum through its air valves, causing a step by step movement, called 'notching up,' and throwing the motors into the usual series parallel combinations. When the master controller is off and air cylinder opens the automatic circuit breaker referred to, and the main controller drum also returns to the off position.

"The greatest danger in any control system is the possible inability to cut off power when necessary. On ordinary street cars an overhead switch on the platform accomplishes this. In the usual multiple unit practice the failure of the current supply opens the control circuits, and every possible safeguard is employed to avoid the danger above suggested. In the Westinghouse system the train cable has seven wires, one each for the battery current, forward reverse, backward reverse, series, multiple, off and main switch. There are five air cylinders, one each for the main switch, forward reverse, backward reverse, notching up main controller drum and off controller. In the Sprague system the main controller is similar to that of the ordinary street car controller in its functions, except that owing to patent courses, the reverser drum is in a separate case from the controller drum, and the series and multiple connections are all made on a separate piece of apparatus. The first motion of the master controller handle throws current to the reverse solenoid, turning the drum to either forward or back position, and the main controller drum is then released, and notched up by a small direct-connected motor called the 'pilot motor,' whereby the main motors of the car are operated in the usual fashion. The pilot motor is not controlled directly by the master controller, but is operated by relays. After the first step has been passed over the master controller cylinder, which starts the reverser the second step operates the relays of the pilot motor rheostat. The Sprague system derives its current from the trolley or third rail, as does the General Electric.

"On the relay circuits of the pilot motor is an automatic throttle which absolutely limits the acceleration of each car, and prevents more than a certain predetermined current's flowing through the motors. If this throttle is traversed by too large a current the contact lifts, and the pilot motor stops the rheostat and controller drum at once. Thus the acceleration is automatic, and it is absolutely impossible for a motorman to vary it. As soon as the main motors have speeded up properly the pilot motor starts again, and so proceeds until all the resistance is cut out. Little or no training in the actual handling of the controller is required with new motormen. It is impossible for a motorman to jerk a train in starting. Any notch of the control can be run upon for yard movement. As yet, I understand that the throttle is not applied to the General Electric system, a mechanical feature being introduced to caution the motorman from accelerating too fast. In the Sprague system is a 'coast' contact, which runs the pilot motor backward, thereby throwing the rheostat off the circuits. The car cannot possibly be started without the reversers being either positively in forward or back position.

"One of the safeguards of the Sprague system is the facility of opening the main circuits which exists. This may be done either by the reverser, the automatic stop relay, which is actuated by the reverser solenoid current, and runs the pilot motor backward, or the coast relay. The reverser cannot be thrown in a second time unless the main controller is completely at the 'off' position. The car will not move unless the reverser is in one position or the other for forward or back motion.

"The General Electric system has the usual master controller in the cab, and its reverser is a piece of apparatus by itself, operated directly from the master controller by solenoids. It is a dead switch, and never moves while the current is on, and 'stays put' in its last position when once the controller handle is moved forward. Only the rupturing of the current supply will throw the reverser off. The series, multiple, and resistance contacts are each made on separate pieces of apparatus, called 'contactors.' A two-motor equipment of moderate size requires thirteen contactors per car. I have seen this control in operation in New York or Brooklyn, where it has been in service nearly two years, and the apparatus is certainly very rugged, and has stood the test of working experience very well. In the General Electric train line are nine wires, there being two for the reverser, one for the series, one for the multiple position, and five for resistance combinations. These operate the thirteen contactors. A four-motor equipment requires twenty-six contactors.

"There are four fundamental requirements in any system of multiple unit control:

"1st. Absolute certainty of the opening of the main motor circuits when the master controller goes to 'off' position.

"2d. Proper car direction of movement under all circumstances.

"3d. Motor-control circuit never closed unless all resistance is in, and then the step by step cutting out of this resistance.

"4th. In my opinion very important automatic throttle control.

"I think those of you that have operated motors of over 75 hp will agree that they are very hard upon controllers. A few of our cars on the elevated division are equipped with four 75-hp motors, and the remainder with two 150-hp motors. The current of the latter equipments is very hard upon the control, and prob-



ably four times as frequent inspection is required over the four-motor equipments.

"More trouble arises from the heavy currents encountered in slow-speed yard work than with the lighter currents required to operate at high speeds. We have no circuit breakers on the elevated cars in Boston, as we did not feel that there was any breaker made which might not 'freeze' or stick at some critical time. Instead we have used No-Arc fuses with considerable success, and lately a copper ribbon fuse,  $1\frac{1}{4}$  ins. wide, 9 ins. between terminals, 10-1000 of an inch thick, with a 1-in. roll. These fuses rupture nicely at 600 amps. We have also used shoe fuses successfully on each of the four contact-shoes, these are constituted of copper wire. The small percentage of weight on drivers found in locomotive systems limits the acceleration which can be obtained. Then two 150-hp per axle is about the limit of equipment, which can readily be applied to the type of cars now in use in this country. By the adoption of the multiple unit electric system the Liverpool Overhead Railway has raised its schedule speed from 12 miles to 19 miles per hour. The Manhattan Elevated in New York use the General Electric system of multiple control, two cars out of three being motor cars. In rush hours two trains are coupled together, making four motor cars and two trailers per train. The train can be operated from any platform, and in any of the three multiple unit systems there is practically no limit to the number of cars that can be operated in a train together. Trains are generally cheaper to operate than the same number single cars in point of transportation wages. The multiple unit system gives a very elastic arrangement of cars from the operating standpoint. The best of brakes should be installed on all such high-powered equipments as are to-day utilizing the multiple unit control.

"Straight air' is easier to handle than automatic air in many classes of service, as simply opening the valve handle applies the brakes by direct-air pressure, but with more than one car straight air brakes are very dangerous, especially on grades. Here it is hard to handle, and to get the proper application is not easy. The brake must be entirely released before a second application can be made, and if many are made on a single grade it is not long before the motorman finds himself out of air supply. It takes about one second to restore 1 lb. of air with this system, and unless the valve is in the off position the auxiliary reservoir cannot be restored. Steam roads using straight air employ a retaining valve, to enable long applications to be made on grades."

In the discussion which followed, Chief Electrician Hall, of the Boston & Maine Railroad, stated that his road uses the multiple unit system of control on its line between Concord and Manchester, N. H. It has been found extremely useful in handling rush business.

H. S. Knowlton, of Boston, then spoke of the multiple unit control as installed upon the Seattle-Tacoma Interurban Railway, a road managed and built by Stone & Webster. The line connecting the two cities was opened for business in September of this year, and is about 36 miles long, a schedule time of about  $1\frac{1}{4}$  hours in limited express service being feasible upon it. There are local trains in addition to the express trains. Each train consists of a 30-ton motor car, hauling a 20-ton trailer, and the maximum speed is above 60 m. p. h., with four General Electric 66 (125 hp) motors, gear ratio 1.55. Current is supplied to three sub-stations at about 25,000 volts, three phase, and applied to the motors from both third rail and trolley, according to the right of way at 600 volts. In each sub-station is a 300-kw motor generator set, with a storage battery, operating with a booster in multiple with the set on the station bus-bars. The road is also to be equipped with express cars weighing from 25 tons to 30 tons, each car carrying four General Electric 66-motors, and operating at high speeds in order to get out of the way of the passenger trains, the road being single-tracked. The road also is planning for two or more electric freight locomotives, each equipped with four General Electric 66-motors, geared for a maximum speed of 12 miles per hour, with a 275-ton train on level track. It has been proposed to arrange to throw all four motors in full multiple in the freight equipments, and thus obtain a speed of 24 miles per hour approximately, with the same weight of train, blowing air through the motors by a small fan-motor blower, in order to reduce the heating. On this particular road the cost of the multiple unit system, with all its advantages, was not prohibitively greater than a straight locomotive system, and the lesser points of decreased platform space and more evenly distributed weight upon car body, were not lightly passed by. It has been found difficult to operate the interurban trains at slow enough speeds in Seattle on account of the high-speed gearing, high-powered motors and multiple connection of two motors in the series position. This can probably be obviated by a special commutating switch, with which the motorman can throw all four motors in series for city

running, and thus apply 125 volts or slightly over in city service, thereby enabling the slower city speeds of 12 m. p. h. and under to be properly held, supplemented by judicious braking and coasting. Care has to be used in operating more than one motor car in a train at a time, as the indiscriminate bunching of several equipments would overload the sub-station nearest, even with the battery auxiliary. He further stated that it was his opinion that the energy consumption of trains operating on such a road as the Seattle-Tacoma should not exceed 70 watt-hours per ton mile at the sub-station, direct-current, bus-bars. The maximum accelerating current of each motor trailer train would probably work out in excess of 800 amps. The energy consumption of the control circuits would probably amount to less than 1 per cent of the average current per train.

The paper on "Car House Labor-Saving Appliances, by William Pestell, of the Worcester Consolidated Street Railway Company, was reserved for a later meeting.

### Hudson Valley Railway Strike Ended

The strike on the Hudson Valley Railway has been settled and the lines are again in working order with a full complement of men, and no interference from any source. The company persisted in its refusal to recognize the union, and, as the old employees found that their places were being filled satisfactorily by non-union men, they yielded to the inevitable and made the best terms they could. This decision, it is believed, was prompted in a measure by the fact that the company has maintained a consistent attitude throughout the difficulty, and that it became evident that the management was not to be intimidated by the violence of the mob. The latest outrages, culminating in the riot on Oct. 4, resulted in the indictment of twenty-five men, who were charged with participating in that affair. Thomas Halligan, a boilermaker from New York, who, it is alleged, caused considerable trouble along the line as an agitator, was arrested in Ballston last week. Halligan heard that a warrant was out for his arrest and was trying to escape to New York. It is charged that the prisoner was implicated in the blowing up of the trolley car at Stillwater and other similar outrages. The criminal proceedings had the effect of frightening the labor leaders from other cities, and they quickly left the field of action. With their departure negotiations were reopened on behalf of the men.

On Saturday a committee of the Glens Falls men called on President Colvin and General Manager Josselyn, and after a consultation was asked to formulate a statement of terms upon which the men would return to work. This was agreed on, and the committee submitted terms which, after some amendments, were accepted by the company's officers. The Glens Falls division held several conferences during the day and finally voted to accept the agreement and return to work. The same terms were submitted to the Saratoga and Stillwater divisions, and the Saratoga men voted favorably, while the Stillwater men rejected them. A committee then went to Stillwater and brought back a committee of six, which had several consultations with the representatives of the company. The committee went back to Stillwater, and a meeting of that division was held, at which it was decided to accept the terms and return to work.

It was announced that the terms upon which the strike was settled provide that the men who have been receiving 16 cents an hour will receive 17 cents, and men who have been receiving  $18\frac{1}{2}$  cents will hereafter be paid 19 cents. Instead of having inspectors on the Stillwater division, who are paid 25 cents and 15 cents, that work will be done at night by men from the main offices. All the former employees will be reinstated in their old positions, except those who are under indictment.

The company makes no contract with the union, and does not recognize it in the settlement, the men returning to work as individuals. It is further announced that the men will abandon their present affiliation with the union on the lines of the United Traction Company, and that a new organization will be formed to consist exclusively of employees of the Hudson Valley Company, and have no connection with any other Union.

The case of Motorman Osgood, which has been one of the mooted points, will be placed on exactly the footing that it had before the strike, and he will have a hearing by the officers of the company. Hereafter any employee has the right to appeal to the general manager of the company.

The strike cost the company and the men a great deal of money, but the heaviest expenditure was that for the maintenance of the troops which were called out to preserve order and protect property. This will fall upon the counties in which the disturbances occurred.



**Accident Blanks**

The extended paper on the subject of accidents, by C. R. Barnes, electrical expert of the New York Board of Railroad Commissioners, and the paper and discussion on the adjustment of accident claims at the recent Detroit convention, indicate the practical importance of this subject of street railway operation and the necessity of procuring and having on file full details in regard to any accident. In no other way can the claim agent be sure of the actual liability of the company to the victim of the disaster, or the advisability of settling a claim before a suit is brought.

The methods followed by the different railway companies in securing reports of accidents are multifold, but practically all include a statement to be secured from the conductor and motorman, the victim, if possible, as well as any witnesses who may be on the car or in the neighborhood. A study of the different blanks in use reveals a variety of the practice. Thus, the San Francisco & San Mateo Railway Company requests the witnesses, besides making a statement of the accident, to indicate where he or she was at the time the accident occurred, and if a passenger to mark his position on a small sketch of a car contained in the blank, or if a pedestrian, on a sketch of the street. The accident blank of this company to be filled out by witnesses is given below:

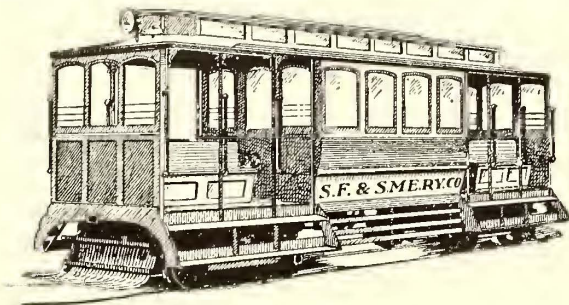
San Francisco & San Mateo E. Ry. Co.  
Office: 102 Thirtieth Street,  
San Francisco.

Accident Report No. ....

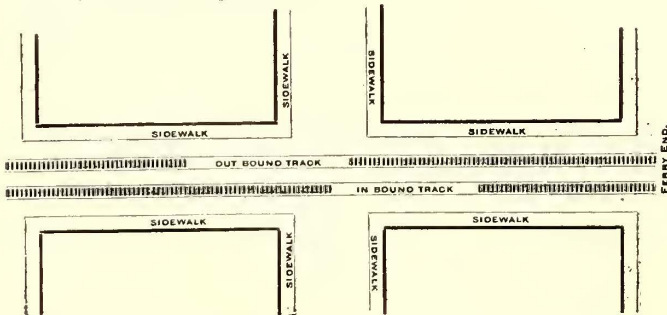
**STATEMENT OF**

Name .....  
Occupation .....  
Address .....  
Date ..... 190...  
Date of accident..... Time.....  
Were you a passenger.....  
State number of car.....  
Where did you board the car.....  
In what direction was the car going (towards the Ferry or away from it).....  
Were you sitting or standing upon the car.....  
Were you on the right or left-hand side of the car, looking ahead .....

Please mark the place you occupied on the car on this sketch.



Mark on diagram below, names of streets and position of car at time of accident. If you were on the street at the time of the accident, mark the spot.



State the sex of person injured and about what age.

Extent of injury or damage to property so far as you were able to see it.

**CAUSE OF ACCIDENT:—**

Here state as fully as you are able how the accident occurred, from your point of view. Also state as accurately as possible:  
(1) Was the bell rung by the motorman before the accident?  
(2) The distance or time during which it was rung. (3) How far

the car ran after the accident occurred. (4) Any other particulars you think material.

Please sign your statement in full.

The information required on the blank to be filled out by conductors in the case of all accidents is as follows:

**ACCIDENT REPORT.**

**INSTRUCTIONS.**

On this blank will be reported all accidents to persons or property, however they may be caused, and accidents to cars, with injury to same.

Date of Report.....18.., Hour and Date of Accident.....18..  
Run No....., Car No....., Badge No....., Line.....  
Leaving.....Street at.....M. Motorman.....  
For .....,  
At or near which Street.....Exact Time.....  
Number of Passengers on Car.....  
Name and address of person injured.....  
Extent of injury.....  
Address of relatives or friends.....  
What disposition made of injured person.....  
Age .....,  
Description .....,  
Cause of Accident.....  
What Physician (if any) attended injured person.....  
By whose order was he summoned.....  
Detention to car.....  
State briefly amount damage (if any) to car.....  
Give a complete account of how the accident occurred. (State if the bell was rung and for what distance it was ringing before the accident occurred; at what speed the car was traveling just before the accident; if it slowed up at all; the distance car ran, after the accident, before it came to a stop, and any other particulars you recollect. If there is not enough space here for you to write all you know, ask the Receiving Clerk for a Supplemental Accident form, and continue on it your account of the accident.)

A number of companies have adopted the policy of printing the accident blanks to be filled out by the conductor and motorman, a set of rules to be followed by them in case of accident, so that these rules will be fresh in their minds and that there will be no possibility of a claim of ignorance of it. Some of these instructions are very complete, as will be seen from the following, which are reproduced from the report used by the New Orleans City Railroad Company:

**ACCIDENT RULES.**

The term accident includes injury to persons or property, collisions, breakages of all kinds to the cars, ejections, personal trouble in car between employes and passengers or between passengers, and any event of any name or nature occurring upon a trip, wherein damages occur to persons or their property, to car, to vehicles, or wherein the possibility of damages may arise from any action of employees or passengers themselves, whether complained of or not.

Conductors are not permitted to use discretion as to reporting or not any occurrence included in above statement, but must report promptly all matters coming within above list.

Reports must be truthful and state exact facts, without fear, favor or prejudice, and no attempt must be made in a report to shield any employee, or to conceal any of the circumstances surrounding the occurrence reported. Reports must state facts which can be sworn to in court by the employee reporting or by the party or parties named as witnesses. Inferences, opinions and suggestions must be stated as such, and not as facts. Reports must give:

- 1st. Date of accident and exact time of day when it occurred.
- 2d. Exact place of occurrence, full name and address of party injured, or likely to have been injured, either in person, property or feelings; the owner of property damaged or doing damage to company's property; if vehicle, name of driver, license number and year of issue.
- 3d. Nature of accident, and cause of its occurrence. This cause must be carefully ascertained.
- 4th. Full name and address of all passengers, bystanders and employes, as far as possible, whether they saw how the accident happened or not.
- 5th. Distance where car stopped, after the accident happened, from place on the street where accident occurred; measurement to be made by stepping the distance from the front end of car to point of accident. This measurement should be witnessed by a bystander, or some one not connected with the company.



6th. Statement of injuries or damages as well as any expressions of opinion from bystanders regarding the accident.

Above report must be filled out upon blank for that purpose, signed by the conductor and motorman, and left at the station after turning in car.

In the event of personal injury care must be taken to render all the necessary assistance and attention to person injured.

The most trivial and apparently unimportant accident or occurrence in or about the car, even where a person declines to give name, claims no injury, or seems to regard the whole matter as trifling, must be reported with as much care as though the damage or affair was of the utmost importance.

All accidents must be telephoned to general office of company as soon as possible, and especially in the event of a serious accident, the general office must be notified immediately so that prompt aid may be furnished and investigation begun pending the full report.

It is expected that a report will be made of all accidents or injuries that may occur on the track, or within 10 ft. of same, whether the car was concerned in the accident or not.

Attention is specially called to questions arising between conductors and passengers, as to the payment of fare, character of money offered, change furnished, transfers or other complaints leading to disorderly or boisterous conduct, in each of which events conductors must secure positive proof and eye witnesses, so as to be able to clearly substantiate the truthfulness of his report in court, particularly before any ejection or arrest is attempted, and full report of the same must be promptly made in accordance with above rules. No ejection must be made without first refunding fare.

Conductors or other employees must not talk about, or give any information whatever concerning an accident to any person, other than the proper officer or person delegated with the authority of the company to investigate the occurrence, and all questions asked of any employee of company, except by person or persons above named, must be answered by directing the questioner to general office for information.

Employees must not visit an injured party, or family, to make inquiries or discuss accident without authority of company.

The above rules must be strictly observed, and too much stress cannot be laid upon their importance. If any doubt as to their meaning in any respect exists in the minds of employees, they should consult, for their own protection and the company's, their station foreman.

In other cases rules are much more brief, as will be seen by reference to the formula printed on the inside of the accident report book used on the street railway system of the Washington Water Power Company, of Spokane, Wash., and which are given below:

#### RULES IN REGARD TO ACCIDENTS.

The conductors will use every possible precaution to avoid accidents. If an accident should occur, they will—

1st. Stop the car immediately, ascertain the name, residence and business address of the injured person, render all possible assistance; if necessary taking them to a drug store, if one is near by.

2d. In case the accident is at all serious, conductor will telephone immediately to superintendent's office—Telephone 437½—stating place and nature of accident.

3d. They will ascertain the names, residence and business addresses of all passengers in car, and of all persons who witnessed the accident, and at end of trip make out a written report and send same at once to superintendent, giving full and detailed report of the occurrence.

4th. Conductors will refrain from conversation or giving any information of any accident to any person other than the proper officials of the company. You will not accompany injured party home or call upon same, without consent of superintendent.

NOTE.—The above rules regarding accidents are of the utmost importance, and must be observed, no matter how slight the accident to person or property.

For Example.—If a person falls in stepping from your car, even when the car is at a standstill, and the accident is due entirely to passenger's own carelessness, and passenger insists that he or she is not hurt, the name and address of such person, with witnesses, must be taken and reported to the superintendent. This is absolutely necessary for the protection of both company and conductor. Accident reports must be handed to proper officer of the company at the first opportunity.

Avoiding Accidents.—Before going around curves motormen must be sure there is no danger to persons or teams before proceeding.

Before leaving car to flag across other tracks, conductors must request passengers to remain seated.

When approaching bridges, viaducts, poles or other objects near the track, conductors will warn all persons standing on footboard of open cars or on rear platform of closed cars.

#### Decision on Chicago Transfer Cases

A decision of much importance was handed down by the Illinois Supreme Court, Oct. 25, regarding the right of the Chicago Union Traction Company and the Chicago Consolidated Traction Company to charge more than one fare for a ride from the city limits down town, or to refuse transfers from the North Side to the West Side lines and visa versa. The Chicago Union Traction Company operates all the downtown surface lines on the North Side and West Side, and the Chicago Traction Company owns the lines in the outlying districts. The Chicago Consolidated Traction Company is the property of the Chicago Union Traction Company. Last spring some of the residents of districts near the city limits along the Consolidated Traction Company's lines revived an old city ordinance requiring the issuance of transfers between any two street railway lines owned or controlled by the same company, and demanded that instead of paying two fares as heretofore in order to reach the business district, they be given free transfers. Suit was brought to compel the companies to do this. The decision of the lower court was favorable to the city, and the recent Supreme Court decision confirms the decision of the lower court. The practical effect of the decision is not only to establish the power of the city to require free transfers between the lines of the Union and the Consolidated Traction Companies but also to require free transfers between the lines on the West Side and North Side which are owned by different underlying companies, but are all leased and operated by the Chicago Union Traction Company. The decision even goes further than this, and establishes the power of the city to regulate fares in spite of franchise terms. This would hardly seem to be in accordance with the decision of the United States Supreme Court last March, when the power of the Detroit City Council to change rates of fare from those named in the ordinance was denied, and the franchise considered as a contract that could not be broken. The points involved are not all exactly the same, but it would be interesting to see what disposal the United States Supreme Court would make of the Chicago case.

The directors of the Chicago Union Traction Company have held a meeting and instructed its officers to comply with the decision and prepare to issue transfers between outlying and downtown lines, and between the North Side and West Side. Just what effect it will have on the earnings cannot be safely predicted.

The decision will end a stubborn fight between citizens of outlying wards and the Union Traction Company over "one fare" transportation.

Judge Ball upheld the city ordinance requiring this "one fare" ride in the spring. The Union Traction Company refused to act on this decision until it had been passed on by the Supreme Court. The citizens affected endeavored to force compliance at once, and the result was a succession of small fights in which passengers were ejected from West Side and North Side electric and cable trains.

In passing on this question the Supreme Court, first of all, affirms the city's right to regulate fares. It says an examination of the city charters of 1851, 1863 and 1872 reveals the fact that the power had been granted. It is further stated that the general doctrine is that the Legislature has the right to regulate fares and charges of common carriers, and that the municipality may exercise that power by delegation from the State.

On the question of the franchise contract between the city and the street railway companies the court held that the corporations exercise their powers subject to municipal regulations, and if there were any contracts such as claimed by the Union Traction Company, through assignment to it from the subsidiary companies, the enforcement of the transfer ordinance is not a violation of them.

The freight business of the Toledo interurban lines has increased so rapidly of late that it has been decided to double the facilities of the present freight station by the erection of a duplicate of the present building, which was illustrated and described in a recent issue of this paper. The structure will be 125 ft. x 28 ft., and will have four doors. It will be arranged so that freight can be unloaded from the trucks into the cars.



## Why Transfers Should be Registered

BY GEORGE WILKES

The general public must be taken into consideration in determining upon any system of collecting and registering fares. In certain States the "bobtail car" and the requirement that passengers deposit their fares in boxes, provided for the purpose, proved objectionable, and the public was sustained by the courts. The Canadian "coffee-pot," though not a preventive of dishonesty, has been tried and found wanting in public estimation. The European system of issuing printed receipts, numbered consecutively, accompanied by an inspector's periodical verification of the sequence of their issue by the conductor and their possession by the passenger, would not be tolerated, nor would the proposition contained in the paper, "Registration of Transfers," by C. D. Meneely, read at the recent convention of the American Street Railway Association, admittedly inadvisable under federal law, to award cash prizes, determined by public drawings, to certain holders of fare receipts, prove profitable. The American public, unfortunately, does not consider it dishonorable to defraud a corporation, especially a railway, and a negotiable value—which no perspective prize could influence—would attach to such receipts, and they would eventually return to and be reissued by the dishonest employee. The public cannot be depended upon to detect and report dishonesty, though experience has demonstrated that a few may advise of seeming discrepancies where fare registers are in use.

Taking into consideration our requirements it is doubtful if the present general method, properly applied, can be improved upon.

Perfect accountancy exacts a record of all transactions; conductors should therefore be required to account for all passengers riding on their cars. The non-registration of transfers is a violation of this fundamental principle and practically conveys an assurance of immunity from detection to the dishonest employee. Advocates of non-registration exact the collection of a value of which they require no accounting. Should transfer returns be exacted, though not registered, trading between dishonest conductors naturally results, to enable them to cover their peculations of cash fares. These returns, with the registered fares, will equal and frequently exceed the total of passengers carried. Registration is the only practical basis for the detection of trading of transfers between conductors. It is a fallacy to assume that the non-registration of transfers focuses the attention of the conductor on the collection and registration of real revenue—cash fares. Condoned carelessness in one direction will not improve service in another.

Transfers properly registered may be readily checked and separated from cash collections; evidence to the contrary being an indication of weakness of method or incompetency of a secret service department.

As the transfer cannot be divested of its value to the traveling public, that value cannot be nullified through non-registration by conductors, nor should proper registration attach a value to it comparable with a cash fare.

It is not intended, in this article, to cover the entire field of a conductor's duties in the operation of a street car, excepting in the relation to the collection and registration of cash fares and transfers and their proper accountancy; considering the scope, a slight digression is allowable where a standard of employee and proper discipline are necessary to the maintenance of a service.

Experience has proven the error that any character of man is competent to collect fares. A conductor's duties are arduous and difficult, and his efficiency determines the public sentiment of a community toward the management. The conductor should, therefore, be selected with a view to his ultimate efficiency. He should possess a fair education, to enable him to render complete and accurate returns of his collections on his "day card," such as may be required by his company.

As simplicity in accounts lessens opportunity for error and fraud, "day cards" should conform to such a requirement. The line, run and car numbers, the conductor's and motorman's names and badge numbers, and the reading of the totalizer figures of the register at the commencement and ending of a shift or a day's work, the difference between such readings, the commencing and ending numbers of transfer pads issued and the difference between such numbers should be clearly indicated. The several character of fares should be separated under proper columns for each half-trip, and should be indicative of the trip number, direction shown on register and schedule leaving and arrival time at terminals. The "day card" and unused transfers should accompany all cash collected during the shift or day. Transfers collected should be enclosed in an envelope, properly marked, to indicate the trip on

which they were collected, and deposited in a receptacle, provided for the purpose, at each terminal at the conclusion of each half trip, or such a receptacle may be placed in each car for the same purpose. It is preferable, if practicable, that transfers be printed with the date of intended issue and be issued only by transfer agents. Under all circumstances transfer points should be well defined and limited in number. Should transfers be issued by conductors they should be given only at the time of payment of the fare. A general transfer station, such as in operation by the Nashville (Tenn.) Railway and others is advisable where transfer issues may be restricted to a single point.

Like in accounts, simplicity in fare registers lessens opportunity for fraud. Registers are intended to indicate to the public the honesty of the servant, while multiplex registers have a tendency to confuse, to the advantage of the unscrupulous employee. Mechanically written "day cards" are liable to create differences difficult to adjust, and will dissatisfy and demoralize an honest conductor.

Cash, coupons, tickets, etc., representative of a 5-cent fare, should be registered together, and transfers separately, on the same or another dial. A desirable method of registering transfers would consist of a combined dial register and cancelling bell punch, to be worn on the conductor's person. Each register dial should plainly indicate the direction. Too little attention is given this important detail. A dishonest conductor might have several passengers properly registered on his "out" trip, and purposely fail to change his register for the ensuing "in" trip; he would thus be in a position to collect fares without registering, to the extent of those recorded for the previous "out" trip, and have the register cover the total of passengers on the car.

An occasional clerical comparison of transfer returns to determine the necessary proximity of intersecting cars may be made, in addition to secret service, to determine if trading exists. The desirability of the uniformed register inspector must remain a matter of doubt.

Given proper discipline and an efficient employment and inspection service, it will be impossible for a conductor to tamper with a register without the fact becoming known through a single inspection report.

On interurban roads, where varied rates of fare prevail, 5-cent fares should be registered, and other and through fares should be audited from the punched duplicate of a duplex ticket, the original being furnished the passenger.

Careful selection of employees, fair wages, considerate treatment and encouragement of a conscientious performance of duties are essential features of a proper management of properties.

Transfers should be printed in such form as to admit of their easy manipulation. Different colors may be used to indicate the transferred direction, as red for North, white for South, blue for East, yellow for West. It is essential that they be numbered consecutively for record purposes and to detect counterfeiting. Date, time and transfer point should be indicated by punch marks, or otherwise, on all transfers issued.

## Mr. Vreeland Not to Go to London

A statement was published in one of the New York papers, last week, that Mr. Vreeland, president of the Interurban Street Railway Company, of New York, had been offered and had accepted the management of the Yerkes underground railways in London. The report has been officially and absolutely denied by Mr. Vreeland, who states that he has no present intention of leaving the New York system, which he has done so much to perfect. The rumor was the occasion for a number of very complimentary notices in regard to Mr. Vreeland's management in the daily press, which indicates the high regard in which he is held in this city. It is not possible to reproduce all of these, but the following is taken from an editorial on the subject in the New York Tribune:

The assurance that Mr. Vreeland is to stay in New York and keep on attending to the business which has had the advantage of his supervision so long will, we think, give general pleasure. Under his management of the Metropolitan lines many improvements have been effected for which he is fairly entitled to praise. Outsiders cannot know just how great his share of credit ought to be, but the general understanding is that the benefits which the public enjoys are largely due to his sagacity and enterprising spirit. Important consolidations contributing to the convenience of the community have been effected, an up-to-date motive power has been installed, the equipment has been otherwise vastly improved and a liberal transfer system has been introduced. In short, New York does not now suffer greatly by comparison with other cities in respect to street railroad facilities, whereas not long ago it was absurdly and disgracefully behind the times. It should be added that under Mr. Vreeland's administration the company has lived on good terms with its employees, whose well being it has aimed to promote by various wise measures, including a pension system.



## Transmission Lines for Electric Railways

BY ALTON D. ADAMS

The question is often asked, where does direct feeding to trolley lines cease to be good practice, and at what point do sub-stations enter the problem advantageously?

The economic limits of distribution to electric railways at 500 volts to 600 volts is bound to vary with other factors, but they are not fixed with even approximate uniformity by the practice of existing systems. If a trolley system is divided into separate parts, each of which has its own feeder from the power station, the limiting conditions for the length of any feeder may be readily determined. Take, for illustration, a case where the feeder must deliver 200 kw for use in the car motors and cover loss in the return circuit. If this delivery of energy is to be made at a distance of 5 miles from the generating station it will be well to put the station voltage at 600 approximately, and allow a drop of about 100 volts in the feeder at maximum load. Taking 11 ohms per mill foot as the resistance of commercial copper wire, the size of cable necessary to deliver 200 kw at 500 volts on the trolley wire when the drop is just 100 volts, is found from the formula

$$C. M. = \frac{400 \times 11 \times 26,400}{100} = 1,161,600.$$

As this is an odd size of cable, it will be better to use the nearest standard size, which is 1,000,000 C. M. If this figure for the cable is substituted in the formula just given, with X in place of 100, the drop of pressure in the cable will be found to be 116 volts. So to get 500 volts at the trolley wire the station voltage must be 616. Of course the trolley line voltage of 500 above the negative bus-bar at the station will not all be available for the motors, because there must be a material drop of pressure along the 5 miles of return circuit through the rails. If this drop along the rails equals that in the feeder the pressure between motor terminals will be only 500-116 or 384 volts. This pressure is lower than ought to be permitted in good practice, so that the drop of 116 volts in the feeder is fully as much as it should be for any ordinary case. A cable of 1,000,000 C. M., with weather-proof insulation, weighs very close to 18,750 lbs. per mile, so that the 5 miles of it in this case will have a weight of 93,750 lbs. At 15 cents per pound this feeder 5 miles long costs \$14,055.

Assume now that another section of the trolley line is so located that a feeder to it must extend 10 miles from the power station, and that this section also requires 200 kw delivered at the trolley wire. As it is not advisable to allow a drop of pressure greater than that in the other cable, the weight must go up as the square of the distance. In other words, the feeder 10 miles long must consist of two cables of 1,000,000 C. M. each, or their equivalent in wires of other section, so that the weight of feeder is 374,800 lbs., and its cost is \$56,220.

Evidently the conditions named approach, if they do not pass, the limit where it will pay to change to transmission at high pressure and erect a sub-station with transformers and rotary converters. Conditions as to the requirements for energy on particular sections of a trolley line are frequently not as clear cut as those just assumed, or the distant loads as heavy, but examples from actual construction are not wanting to show the great weights of long feeders. Another factor that tends to reduce the weight of present railway feeders is the fact that such feeders have often been put up without accurate computation of the maximum rate at which they must transmit energy. As a result it is not hard to-day to find electric railways on which, at times of greatest load, hardly more than one-half of the energy sent out by the power station is expended in the car motors. The following examples of fairly heavy feed wires are taken from lines that have been constructed within the last year:

In one case a single-track railway, about 22 miles long, has a generating station about 3 miles from one end of it, and a sub-station, which for present purposes may be considered another generating station, about 12.8 miles from the generating station and 7 miles from the other end of the track. This line is equipped with twenty-five cars that carry sixty-five motors, and the heaviest part of the traffic is on that half of the line nearer the generating plant. From this plant the trolley wire is fed with 41,250 ft. of cable, with a section of 500,000 C. M., extending in both directions along the track, and for a distance of 25,000 ft. toward the sub-station. Besides the feeders just named a pair of No. 0000 wires extend all the way from the generating station to the more distant end of the line, with a double length of 95,000 ft. This pair of 0000 feeders is also supplied with energy from the sub-station. All of these feeders convey energy at 500 volts to 600 volts. Taking the weight of weather-proof wire, double

braided, at 720 lbs. per 1000 ft. of No. 0000, and 1875 lbs. per 1000 ft. for 500,000 C. M. cable, the weight of feeders on this line reaches 206,475 lbs., or nearly 9400 lbs. per mile of track. At 15 cents per pound the cost of these feeders is \$30,981, or \$1,408 per mile of track. These figures are for a line of track no part of which is more than 6 miles from a station feeding it, and on which traffic is only moderately heavy.

In another case, feeders, with an aggregate section of 1,811,000 C. M., are run from a sub-station with a capacity of 600 kw in rotary converters. These feeders extend to central points in the electric railways of two distant cities, one of which points is about 9 miles, and the other point about 7.8 miles from the sub-station. From the sub-station to these two feeding points the weight of feeders for the trolley wire is approximately 300,000 lbs., or 500 lbs. per kilowatt capacity of the rotaries in the sub-station. At 15 cents per pound these trolley feeders represent an investment of \$75 for each kilowatt of capacity in the sub-station from which they deliver energy to a distance of about 9 miles. Seventy-five dollars per kilowatt of capacity will go a long way toward paying for step-down transformers, rotary converters and sub-stations. Both theory and the best practice seem to indicate that the economic radius of distribution to electric railways at 500 volts to 600 volts is less than 10 miles.

Alternating generators for electric railway work may now be had with voltages up to 13,000, so that in ordinary transmissions it is not necessary to use step-up transformers.

## The Buffalo, Dunkirk & Western Railway

Details of the proposed Buffalo, Dunkirk & Western Railway have been given out by the Cleveland people who are interested in the company. Among them are Hon. Luther Allen, James W. Holcomb and Jay Latimer, who are interested in the Cleveland, Painesville & Ashtabula Railway, now under construction. These gentlemen have acquired an interest in the Dunkirk & Point Gratiot Railway Company, operating 7 miles of road out of Dunkirk, N. Y. This property is to be consolidated with the proposed road. The line will run out of Buffalo on Ridge Street to West Seneca, down the Erie Shore Road, 10 miles to Lake View Station; thence by private right of way through Angola, Farnham, Irving, Silver Creek and Dunkirk, running through Dunkirk on the tracks of the Dunkirk & Point Gratiot Railway Company. From Dunkirk to Buffalo all the right of way has been secured, and much of it has been secured from Dunkirk to Westfield. At Westfield the line will connect with a line to be built by the Erie Rapid Transit Company, and when links are completed there will be a continuous line along the shores of Lake Erie from Buffalo to Detroit. It is denied that as soon as these links are filled up an effort will be made to consolidate all the connecting roads into a single line, which would be nearly 400 miles in length. W. J. Conners, of Buffalo, and Daniel F. Toomey, of Dunkirk, are among the New York men who are interested in the Buffalo, Dunkirk & Western Railway.

## Changes in the Personnel of the Cincinnati Traction Company

A number of changes have recently been made in the personnel of the Cincinnati Traction Company, owing to the recent resignation of R. I. Todd, former second vice-president and assistant general manager of the company. Dana Stevens, the treasurer of the company, has been made assistant general manager, and will assume the duties formerly looked after by Mr. Todd. His title will be assistant general manager, the second vice-presidency having been abolished. W. H. McAllister, the present auditor of the company, has been named to succeed Mr. Stevens as treasurer, and Charles F. Callaway, the assistant auditor, will become the auditor.

## Address of the Secretary of the Street Railway Accountants' Association

W. B. Brockway, secretary of the Street Railway Accountants' Association of America, requests the publication of a note that all mail to him relating to the Accountants' Association should be addressed to his residence, 40 Morris Street, Yonkers, N. Y. Mr. Brockway's business address is Room 417, Broad Exchange, 25 Broad Street, New York.



## COMMUNICATIONS

### President Vreeland's Address

Oct. 30, 1902.

EDITORS STREET RAILWAY JOURNAL:

The presidential address, delivered at the Detroit convention, by Mr. Vreeland, of the Metropolitan Street Railway Company, of New York city, outlined in the clearest possible manner the general relations of the street railways with municipal authorities and newspapers in the majority of cities in the United States. His remarks were not only absolutely correct, but have been strikingly exemplified in the case of the newspapers, during the last two or three weeks, by the comments which have been printed in a number of cases on the address itself. In fact, some editors were so anxious to set their papers right before the general public that they overstepped the mark, and showed in their articles an animus which Mr. Vreeland characterized, in exceedingly moderate language, when he said: "And the public newspapers so far from taking into account the service we are rendering and protecting us against the schemes of demagogues, are rather inclined to regard injuries so inflicted with amused indifference, if not with positive favor."

In this statement Mr. Vreeland hits the nail on the head. If the editors of some of our daily papers were better informed regarding the profits made by the majority of street railways, and of business in general, instead of possessing the unbounded ability of "excoriation," they would take a milder and more common sense position relative to the majority of public service corporations. It is easier, however, to take the role of general critic, because it takes less knowledge of the true conditions, and this attitude is, as a rule, a more popular one with many readers, who are pleased to feel that somebody else is championing their rights and defending them against oppression, rather than commending the other fellow. As a result the policy of villification continues.

One result of this plan of indiscriminate denunciation and superficial analysis is already showing itself. This is that the general public, or certainly that part of it whose good opinion is worth having, is largely discounting any statements of the kind referred to in papers which indulge in that sort of thing. When a man with even an averaged sized bump of common sense discovers that the editor of any particular paper has the habit of consigning all persons, parties and corporations who disagree with his particular notions, to the limbo of unregenerated souls, or does so as a matter of policy with all public servants, he very soon learns to disregard anything which may be said in the paper in relation to such subjects. If our daily newspaper editors, certainly those who cater to the intelligent portion of the community, could only realize that their present policy is weakening the hold which their opinions have on their readers, the better it would be for every one concerned, and Mr. Vreeland deserves the warm gratitude of all public service corporations, as well as all fair-minded newspaper readers, for the fearless position which he has taken on this subject. The corporations do not object to intelligent criticism, but to that form of it which is based on prejudice and an insufficient knowledge of facts.

A WESTERN MANAGER.

### Work of Committees

Nov. 1, 1902.

EDITORS STREET RAILWAY JOURNAL:

There is one feature of the work of the American Street Railway Association that is worthy of special commendation, and that is its committee work. In every technical association standing committees are necessary. There are certain problems of railway construction, maintenance, operation and general management which can be solved only after many years of careful and continuous consideration. Ample time must be given for collecting facts and figures, for arranging and examining them, for comparing the results of one method or of one locality, or of one period with another, and of determining what is best fitted to survive. Such work must be done by a selected committee, composed of the men most competent to deal with the matter in hand. Having once been selected, the precedent has very properly been established of not changing them every year.

The gentlemen who constitute these committees are busily engaged with the important interests in their keeping, and living as they do in widely separated sections of the country they find it difficult to have more than two or three committee conferences during the year. It is not conducive to the study of problems for the solution of which time is demanded to be continually changing the personnel of the committees. Results of value cannot be accomplished unless there is continuity of service on the important working committees. Men who value their reputations often hesitate to serve on one-year committees, that are expected

to present to the succeeding annual convention a cut and dried solution of some important problem. They are, however, willing to serve on committees which are permitted to report progress each year until they have had all the time necessary to reach a definite conclusion and make a final report.

The association is to be congratulated upon having adopted, some years ago, the plan of having standing committees. It has at present a committee on standards and one on standard code of rules. Although these committees are not provided for in the constitution or by-laws of the association they have, by common consent, become known as continuous committees. The question of signals and safety appliances has grown to be of such vital importance to the members of the association that the suggestion has been made to have those subjects also referred to a standing committee. The annual reports of these committees should be of infinitely more value than any paper presented by a single individual, because they represent the careful conclusions of several practical men. It has been the history of every association that has accomplished great and lasting results that its chief reliance has been upon its standing committees, composed of experts in the different departments. To them has fallen the grave responsibility of originating, formulating and developing the association standards, and recommending to the association their adoption.

While it is true that the action of the association must continue to be recommendatory in its character, the fact must not be lost sight of what its recommendations represent. They represent the convictions of the ablest and best railroad managers of the country, who have had exceptional opportunities for gathering information, and who have applied their large experience to the solution of the practical questions submitted to them. It is not to be desired that the action of the association should be otherwise than recommendatory, because it must be borne in mind that the association is conducted in the mutual interest of its members. In view of the diversity of conditions prevailing it is not to their mutual advantage that the action of the association should be made binding upon all the roads. But when the association, after careful investigation and due deliberation, has placed the seal of its approval upon a certain solution of a problem, who is there great enough in himself to say that the action taken is not in accordance with the best practice, and is not for the best interests of the railroads as a whole?

The value of the American Street Railway Association to the electric railways of this continent and to the public, was never better illustrated than at the recent annual meeting in Detroit. The wide range of the subjects discussed, the active and earnest participation of the thoughtful and experienced representatives of the great and small urban and interurban roads, the spirit of mutual interest and co-operation of this body of acknowledged experts, the evident desire to bring about reforms in behalf of the public as well as of the corporations, the public attention to the address of the president and to the proceedings of the convention, amply justify the existence of the association.

A DELEGATE TO THE LAST CONVENTION.

### Selling Current from Railway Service

EDITORS STREET RAILWAY JOURNAL:

Oct. 30, 1902.

Can you furnish us any data regarding prices charged per watt hour for the sale of current from 500-volt service? We have endeavored to establish rates for the sale of power and are anxious to learn what other companies are charging.

JAMES R. ADAMS.

Owing to the attitude of the insurance companies very few street railways have attempted to sell current from 500-volt service, and as a result very little data regarding prices, etc., are obtainable. As a matter of fact, very few street railway companies are in position to sell current, as very few of them have a surplus of power available. It is much more common practice for street railway companies to buy current for the operation of their lines than to sell it for motor service, and in a number of cases where current is being purchased for this purpose the prevailing rate averages from 2 cents to 3 cents. The electric lighting companies, however, furnish current for incandescent lighting at prices ranging from 10 cents to 25 cents per kilowatt-hour; 15 cents to 20 cents per kilowatt-hour may be considered a fair average price. Many of the companies include in this price lamp renewals, but others do not, and there does not seem to be any uniformity in practice on this point. Of course, the rate for current for motor service should be considerably lower than that charged for electric lighting, but this would depend largely upon local conditions, the amount of current required and the time when the service was given, also whether it would be for a short period or extend over several hours a day.



## Signals on Interurban Lines

BY ARTHUR WENTWORTH

In his paper at the recent Detroit convention G. W. Palmer, Jr., speaking of collisions, said: "There is only one way to prevent these accidents, namely, to adopt such rules and methods of operation as will insure that but a single car will occupy any block or section of track at any one time." In a paper on the same subject at the recent Lake George convention Thomas E. Mitten said: "Theoretically the ideal system would be that controlled by an automatic block, operated independent of trolley circuit, and absolute in its action, which would permit of but a single car or train upon a section of track at one time." It would appear that both gentlemen refer to blocking apart cars or trains moving in the same direction. The art of signalling has not yet reached that point where trains or cars in both directions, on single-track roads, can be operated from start to finish without special orders, and guided solely by the block system. For single-track operation the train despatcher is a necessity, which probably cannot be dispensed with for many years to come.

There are many steam roads in the country that operate on crowded sections of double track an automatic, absolute block signal system. The blocks are exceedingly short, and the plant is quite intricate and is expensive to install and maintain. It may be just as well to dismiss from our minds for the present all idea of applying such a refinement of block signalling to the interurban roads and content ourselves with the consideration of that which is cheaper and more practicable. The conditions which are to be met on any given road must be the determining factors. The interval between cars or trains on the interurban lines varies, as a rule, from fifteen minutes to an hour. It is of rare occurrence that the interval will be shorter than fifteen minutes, except where extra cars or trains are sent out and operated as sections of a regular run. The operation of trains in two or more sections is not in itself objectionable, provided proper safeguards are established. The problem with the interurban roads in the operation of trains in sections seems to be to keep the following section from running into its leader, rather than to prevent butting or head-on collisions with cars or trains in the opposite direction. What is wanted is some block signal system or some method of operation which will prevent rear end collisions in the few instances where the interval between cars or trains is less than fifteen minutes. On a road where the sidings are six miles to 8 miles apart, and the speed averages 30 miles to 40 miles per hour, it is entirely practicable to operate a steady fifteen-minute interval and block the cars or trains absolutely 6 miles to 8 mile apart. The question, what kind of a block signal should be used, will depend entirely upon the amount of money each road can spend for the purpose.

Whatever form or character of block signal is used the only thing reasonably to be expected of it is to give an indication to the following car or train whether the block ahead is clear or whether it is occupied. Having given this information to the motorman it remains for the manager of the road, or his train despatcher, to say how the motorman shall be governed. When the clear signal is given there can be no doubt that the rule should permit the motorman to proceed. But what is he to do when the signal indicates that the block is occupied? Will he proceed or wait until the block is cleared? Without question it would be safer to wait until the block is cleared. Any manager who expects to secure absolute safety in operation must insist upon the absolute space limit, and only one car or train within that space at one time. But it is the experience of all the interurban lines that there are times when this is impracticable. In such cases the rule should be to give written notice that the block is occupied, and hold the car or train crew receiving such notice responsible for safe operation, requiring them, under pain of instant dismissal, to approach all curves and obscure places slowly and under absolute control. It should, however, be understood that this does not relieve the crew of the car or train ahead from properly protecting itself. Permissive, or time limit, blocking is operated on the theory that one car or train may safely pass into a block already occupied, provided extreme caution is used by both train and car crews. Only the closest inspection and the most rigid discipline can make it certain that the men will exercise extreme care. It is easy enough to make rules, but a great many disembodied spirits could testify that human lives have paid the penalty of human frailty and carelessness. Roads that are obliged to operate under such conditions may just as well recognize the hazardousness of it, and do the best they can by discipline or by mechanical means to protect their danger points. Having realized that the absolute space limit is the fundamental principle of safety in block signal practice, it remains for each road to get as near to it as its conditions will permit.

Where the interval between cars or trains is fifteen minutes or over there should be little difficulty in devising some simple but effective means of operating the space limit by means of the telegraph or telephone. If the road is too poor to afford some system of manual block signals, with the necessary expense of telegraph or telephone operators, each train or car crew might be made to report themselves to headquarters from each siding or intermediate block station. Now that the interurban roads are going into the business of carrying mail, express and heavy freight, it is necessary to have station buildings, with agents at every town or village and at many of the country sidings. Where there are no agents to assist in the operation of the block system the train crews could be called into requisition, as above indicated.

In the discussion of Mr. Palmer's paper at the Detroit convention, Mr. McCormack contributed a lengthy but interesting statement outlining what has been done by the steam roads, impressing upon the managers of the electric roads the importance of providing some adequate block signal system. He described several well-known block signal systems, but it does not appear that he recommends any of them as being adapted to the conditions of service on the interurban roads. It is to be regretted that with Mr. McCormack's experience in the operation of steam and interurban roads he did not recommend some system of signalling or some method of operation that would meet the requirements of the interurban lines. The managers of the interurban lines seem to be deeply impressed with the importance of the subject, as shown by the expressions from Mr. Palmer and Mr. Mitten, and they are anxiously asking for some system or method that is reliable and not too intricate or expensive. Where the attendance of station agents, operators or switchmen can be secured, it appears that the semaphore signal, operated manually, as directed by telegraph or telephone, would be the cheapest and most reliable system to be adopted. If the road cannot go to the expense of the installation and care of semaphore signals, a green and a red flag may be made to do the necessary duty by day, and the same color of lights at night. Although the human element enters largely into the operation of the telegraph or telephone block system it may, by careful and systematic training and inspection, under suitable rules, be depended upon to give the proper indication to the motorman, and that is about all that any block system will do.

## Restriction on a Jersey Trolley Franchise

The New Jersey & Pennsylvania Traction Company has won part of its fight for 3-cent fares in Trenton, the Common Council granting to the company the right to bring its Trenton, Lawrenceville & Princeton Railroad into the center of the city, and showing a favorable disposition toward the ordinance granting similar favors to the Yardley, Morrisville & Trenton Street Railway, which is also owned by the New Jersey & Pennsylvania Traction Company.

The franchise is unique in that it places more restrictions on the company than has ever before been attempted in this city, and perhaps in this State. The ordinance provides that the fare shall be not more than 3 cents, with free transfers within the city limits, nor more than 5 cents to any point within 5 miles of the limits. Streets occupied are to be paved by the company for a distance of 2 ft. outside the rails, where double track is constructed, and 3 ft. where single track is laid. The right to use the streets shall not be exclusive, but must be shared with any other company or companies bearing a proportionate share of the expense entailed. The right of the city to purchase the company's Delaware River Bridge is made a provision of this grant. In case of any dispute between the company and its employees which might threaten to tie up the road, five arbitrators shall be selected—two by the employees, two by the company and the fifth by the combination; and if this committee fails to settle the difficulty, then a commission shall be appointed by the Common Council. The company is given the right to cross Humboldt Street, Sweet's Avenue, Fountain Avenue and Ingham Street at grade with the extension, where it will leave North Willow Street to run in a direct line to the present terminus. The franchise covers West Hanover Street from North Warren, in the center of the city, to North Willow, near the State Capitol, and up North Willow, crossing the Philadelphia & Reading Railway at grade, to Pennington Avenue, a distance of 2800 ft., where the street will be left and the line will proceed on private right of way for a distance of 2000 ft. to the present terminus at Ingham Street. It is for this 4800 ft. of track that the company is asked to make the concessions named in the franchise.

The New Jersey & Pennsylvania Traction Company also asked for a franchise for 2400 ft. on West Hanover Street, and less than



1000 ft. on Calhoun, or a total of 3400 ft. in all. This ordinance has been laid over until another meeting because of the fact that the city's direct water mains, between the pumping station and the reservoir, run through this street. The company offers to protect the mains in any manner that electrical experts may decide, and, in addition thereto, assume responsibility for any damages that may arise from escaping electrical currents or the jarring of the cars. It also offers to widen the street, at its own expense, from 8 ft. to 20 ft., in order that the tracks shall not really occupy the street space itself. In addition to this the same terms are offered as in the Princeton extension franchise. It is believed that the Council will pass this ordinance, as public opinion demands it. It would interfere with no other company and would be a great help in establishing closer relations between Trenton and the Bucks County (Pennsylvania) towns across the Delaware. Five cents will take one to Morrisville or Yardley when the line is completed.

The New Jersey & Pennsylvania Traction Company will pay in the neighborhood of \$50,000 for these franchises for 8200 ft. of right of way, or more properly speaking, 6200 ft., counting out the private property crossed by the Princeton extension. First of all the company will give to the city, in the Calhoun Street widening, over \$25,000 worth of property, including attendant expenses, and the paving will cost nearly that much more. On streets where the pavement is already laid, as is the case upon all except Calhoun, the company will pay the property owners for the amount of pavement, in accordance with the specifications of the ordinance, but this is included in the \$50,000 estimate. The company will also pay the city \$7,900 for land taken in the neighborhood of the old reservoir property, and as a fitting climax the company is required to pay to the city 1 per cent of its gross earnings after ten years and 3 per cent after twenty years, although the life of the franchise is limited to twenty years.

The New Jersey & Pennsylvania Traction Company, or Johnson Syndicate, as it is locally known, is the outcome of the late Albert L. Johnson's New York-Philadelphia trolley scheme, and is similar in many ways to the Cleveland plans. John B. Hoefgen, the successful bidder for franchises in Cleveland, is president of the Trenton, Lawrenceville & Princeton Railroad, owned by the New Jersey & Pennsylvania Traction Company. The company has expended large sums of money in Trenton and vicinity, and the indications are that it will spend much more very soon. The Delaware Bridge cost more than \$200,000, and about \$100,000 more was expended in the purchase of properties to secure entrances. It cost the company \$27,000 to build and pave the 0.6 mile of road in Princeton. The Princeton line is entirely on private right of way, enclosed with wire fence, and the fares for the 12 miles to Princeton are 10 cents, and to Yardley, 5.5 miles, 5 cents, including the crossing of the Delaware Bridge, which is 2 cents to foot passengers, thus literally making a 3-cent fare to Yardley.

The restrictions which have been imposed on these corporations are unusually burdensome, and cannot be defended. The railway interests in some cases invited this trouble by engaging in competition and blocking each other's progress.

With the entrance of the New Jersey & Pennsylvania Traction Company to the city there will be two foreign corporations in Trenton, although this company's president and superintendent are making this city their permanent home. The Camden & Trenton Railway Company has secured a franchise allowing it to reach the center of the city, and both companies have maps filed covering the whole city. The Trenton & New Brunswick reaches the city line, the Delaware Valley Traction, which is seeking a franchise in Atlantic City, is hard at work securing rights of way in this vicinity, and the Trenton, Pennington & Hopewell Street Railway Company proposes building a line to Hopewell.

### Tramways in Norway

The following is a list of the tramway companies in Norway, length of line, number of cars and some statistics on number of passengers carried during past years:

City	Name or Company	Length in Km	Motor Cars	Trail Cars	Passengers Carried
Kristiania	Kristiania Elektriske Sporvei	8.45	35	22	In 1895, 2,755,174; in 1900, 5,355,285; in 1901, 5,490,068; in first half 1902, 2,823,947 In 1876, 1,462,200; in 1890, 2,286,600; in 1899, 5,621,500; in 1901, 9,359,300 In 1900, *2,661,589; in 1901, 3,023,395; in first half 1902, 1,417,850 First ten months 1898, *651,744; in 1901, 909,469 July 1, 1897, to June 30, 1898, 1,429,038; July 1, 1901, to June 30, 1902, 1,426,192 In 1901, about *1,600,000
Kristiania	Kristiania Sporveisselskab	12.61	47	33	
Kristiania	Kristiania Kommunale Sporveie	7.07	20	12	
Kristiania	Holmenkolbanen	6.36	Total 26	--	
Bergen	Bergens Elektriske Sporvei	6.3	16	5	
Trondhjems	Trondhjems Elektriske Sporvei	3.5	11	--	

\* First business year

### Comparative Statement of the Brooklyn Rapid Transit System

A digest of the annual report of the Brooklyn Rapid Transit Company has already been printed in these pages. The full annual report is just at hand and contains the following comparative statement of earnings and expenses for the years ending June 30, 1902 and 1901:

GROSS EARNINGS	1902	1901	Inc. or Dec, + or -	
			Amount	Pr. Ct.
Passenger	\$ 12,321,265	\$ 11,718,929	+602,336	5.14
Freight, mail and express	64,902	58,394	+ 6,508	11.15
Advertising	124,455	122,501	+ 1,954	1.59
Total earnings from operation	12,510,622	11,899,824	+610,798	5.13
<i>Operating Expenses</i>				
Maintenance of way and structure	567,059	378,800	+188,259	49.60
Maintenance of equipment	1,160,999	891,986	+269,013	30.16
Operation of power plant	1,262,429	1,024,979	+237,450	23.16
Operation of cars—trainmen's wages	2,605,330	2,414,062	+191,268	7.92
Operation of cars—other expenses	975,561	889,827	+ 85,734	9.63
Damages and legal expenses	1,094,745	1,157,593	- 62,848	5.43
General expenses	543,274	458,761	+ 84,513	18.42
Total operating expenses	8,209,397	7,216,008	+993,389	13.04
Net earnings from operation	4,301,225	4,683,816	-382,591	08.17
<i>Income from Other Sources</i>				
Rent of land and buildings	93,248	67,595	+ 25,653	37.95
Rent of tracks and structure	99,051	100,226	- 1,175	1.17
Miscellaneous	85,247	67,914	+ 17,333	25.52
Total income	4,578,771	4,919,551	-340,780	6.93
<i>Deductions</i>				
Taxes	742,817	754,626	- 11,809	1.56
Interest and rentals—net	3,732,633	3,587,122	+145,511	4.05
Total deductions	4,475,450	4,341,748	+133,702	3.08
Net income	103,321	577,803	-474,482	82.12
Special appropriations	84,428	228,678	-144,250	63.07
Surplus	18,893	340,125	-321,232	94.59
Car mileage, surface	36,840,898	35,334,216	+1,506,682	4.26
Car mileage, elevated	15,844,082	14,821,709	+1,022,373	6.90
Total car mileage	52,684,980	50,155,925	+2,529,055	5.04

### The Woman in the Case

One essential difference between the all-pervading electric railways and their older brothers, the steam roads, is the attitude of the general public toward the former. Almost every one who rides or observes the operation of electric cars soon believes that he knows all about the methods of operation and feels certain he can run a car just as well as a regular employee. A recent incident on the Cincinnati, Dayton & Toledo Traction Company's southern division well illustrates this fact, but perhaps in a different manner from previous experiences.

This company employs an electric light block signal system of a kind in common use, whereby the presence of a car in the block is indicated by switching in a certain bank of lamps. The lights are thrown in by the motorman by means of a hand lever when his car enters the block, and are thrown out at the other end when he arrives there.

On this particular occasion an extra car, finishing its run, pulled into the Trenton car house, and the crew did not throw out the signal lights as the car left the main track. Meanwhile, a regular car arrived at the other end of the track and found the lights against them. Knowing that no regular car could be coming and guessing that the extra crew had forgotten to throw the signal, or else were taking their time to do so, they threw the signal switch at their end back and forth several times, as is customary, in order to flash the light and call the attention of men at the car house to it.

The woman in the case lived immediately opposite the car house, and having become accustomed to the way the signals were operated, went out and threw the signal switch to indicate a clear



track, giving the regular car the right of way. No sooner had she done this and the waiting crew cut the light in again as their own signal, than the tardy extra crew, who had been housing their car, came out and threw the signal to clear track again. As a result, when the regular car arrived at the car house its crew found they had been running without protection.

An investigation followed, and nothing would have ever been known, but the woman told about it. Finding she was likely to get into trouble under the Ohio railroad law, she appeared at the general manager's office to tell her story and to beg off. Her excuse was somewhat as follows: "I knew that the car was waiting up at Thornton's switch for nothing, and my husband was coming home from work on it. I cook on a gasolene stove, and my supper was all ready. Now, Mr. Sloat, if you knew how hard it was to keep a supper warm on a gasolene stove, without spoiling, you wouldn't blame me for going over there and throwing that switch, so that my husband could come home."

She said much more, but from the foregoing the reader can surmise that she got off with a lecture only.

### The John Fritz Dinner

A banquet was given at the Waldorf-Astoria on the evening of Oct. 31 to John Fritz, the well-known steel manufacturer and inventor of Bethlehem, Pa., to celebrate his eightieth birthday, and also the foundation of the John Fritz medal. The societies co-operating in the establishment of the medal were the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. The medal fund, which has been mentioned in this paper, was secured by small subscriptions, in order to make it representative, and the subscribers included, besides Americans, distinguished engineers and men engaged in the iron and steel industries in several of the leading countries of Europe. The fund raised amounted to something like \$6,000.

The speakers included Colonel H. G. Prout (toastmaster), Mr. Fritz, Rear Admirable Melville, General Eugene Griffin, John Thomson, Charles H. Haswell, T. Commerford Martin, George S. Morison, Rossiter W. Raymond, Robert W. Hunt, Elihu Thomson, Oliver Williams, D. A. Tompkins and J. C. Kafer. Telegrams of congratulation were received from Andrew Carnegie, C. M. Schwab and others. Mr. Fritz was awarded at the dinner the first John Fritz medal, and was also presented a volume containing the signatures of the subscribers to the fund and a loving cup, the gift of Irving M. Scott, of the Union Iron Works, of San Francisco. The cup was presented to Mr. Fritz by J. C. Kafer. A letter was also read from Hon. A. S. Hewitt, who was to have been present, but who was detained by illness, making a strong plea for individual liberty, which, he said, made possible a career like that of Mr. Fritz.

### Funeral of the Late Prof. Short

The body of the late Professor S. H. Short, who died recently in London, has been brought to this country, and will be given burial at Woodlawn Cemetery, New York. Funeral services will be held at the Church of the Messiah, at the corner of East Thirty-Fourth Street and Park Avenue, New York, on Tuesday, Nov. 11, at 2:30 p. m. All friends of Professor Short are invited to attend the services at the church, and the interment later at Woodlawn, taking train over the Harlem division of the New York Central, immediately after the service, by special car provided.

### Topics of the Week

In the six days of the Grand Army of the Republic encampment at Washington it is reported that 2,000,000 passengers were carried by the Washington Railway & Electric Company. It was a trying period for the employees of the company, but the efficiency with which the vast throngs were handled speaks volumes for the company and its employees.

"What is to become of the old locomotives?" is a question often suggested by the substitution of the electric service for steam on the "L" roads of New York. Already the Second Avenue and Third Avenue lines have been equipped with electric motors, and the Fifty-Eighth Street branch of the Sixth Avenue line is now operated electrically. In a few months it is hoped the entire service will be changed over. The old steam locomotives are being stored in the Manhattan yards at 129th Street, pending disposition of them. The cabs are closed up, the smokestacks protected, and

the entire equipment has a cast-off appearance. Many of them have been disposed of to small roads, mining properties, logging camps and other out-of-the-way places, but they will no longer be utilized for passenger service.

The North American Company, which has just acquired control of the Detroit lighting companies, is largely interested in electric lighting and railway properties in other cities, including Milwaukee, Cincinnati and St. Louis. The company was organized in 1890 under the New Jersey laws, and is known as a holding company. It has done much toward developing the street railway and lighting interests of the country, and is composed of many prominent financiers.

Until a few months ago the method in vogue in Leipzig of avoiding accidents at crossings of electric railways was either to station a flagman at the crossings or to have the conductor run forward to see if the other line was clear. Now an automatic signal lantern, which makes it unnecessary for the trainmen to leave their cars, is being used by the local street railway company. The lantern consists of two boxes, arranged one above the other, each having two sides fitted with red and the other two with green glass, the red being above the green. The cars on one line cause the incandescent lamps in the upper box to burn; the cars on the other line, the lamps in the lower one. This causes, owing to the arrangement of the glass in the boxes, a green light to appear to the first line, which indicates "free passage," and a red light to the second line, which means "stop." Signals are also visible in day time, as reflectors shut out the light of the sun, and the lantern is well lighted from the inside.

A report from Boston says that the residents of Orange, Mass., have been "taken in" to the extent of \$25,000 by a sleek swindler, who represented himself to be the promoter of an electric railway to extend from Orange to Miller's Falls, where a road is in operation to Greenfield. A company was organized to build the road, and the brazen-faced fakir, with a flood of oratory that set forth the project in most alluring fashion, aroused the good people of the district to such excitement that the banks were opened and the gold began to flow to him in an ever increasing stream. But the greatest surprise was when he induced the directors of a bank to indorse \$25,000 worth of the company's notes, which he discounted in Boston for \$15,000. After this coup he made his escape, leaving an enraged public shouting for his scalp. Now, to those who have attempted to negotiate a loan in New England this story will seem incredible, especially as great publicity was given to a swindle of this kind, perpetrated on the residents of Willimantic, Conn., only a few months ago. At that time all New England was warned of the new field that was being operated. But to the sturdy "Down-Easter" there seems to be something alluring about the electric railway, and he falls a ready victim before it. The fakirs, noting this, have not failed to make the most of every opportunity, and if steps are not taken to protect the poor populace the railway fakir will, in point of the numbers of dupes and gold returned, be a close second to Mary Baker Eddy.

Commenting on the demand for recognition of the union which has been made by the striking motormen and conductors of the Hudson Valley Railroad and the refusal of the company to consider it, the New York Times very clearly points out that the position of the men is illogical, and cannot be enforced. If it were possible to unite in a trade union all the men who have learned the trade of that union, and if that trade deals with a public necessity, there is reason to believe that the demands of such a union will be respectfully considered, and even granted, if they do not render the pursuit of the business unprofitable. But what about conducting and running trolley cars? It is unskilled labor. There are differences, of course, in the way in which it is done, but they are individual differences, depending upon native quickness of perception. A union of the men who, at any given time, happen to be in possession of the "jobs" of motormen or conductors is hence not a trades union. It is simply "organized labor," or, in case of a strike, organized idleness. The strikers of a trade union rely for success upon their monopoly of a certain skill necessary to the community. The strikers of organized but unskilled labor rely upon their power to bully and frighten equally capable unemployed persons from taking the jobs they have abandoned. When there are enough unemployed and unskilled persons available to take these jobs, at the minimum wages of unskilled labor, they can be prevented from doing so only by violence or intimidation, by breaches of the peace—in a word, by mob law. Consequently it is pointed out by the employers of motormen and conductors would be foolish to yield to their demands for "recognition."



## The Strike in Geneva

Various reports have been published during the last two months in the daily papers in regard to the street railway strike in Geneva, Switzerland, and have attracted more than usual interest and attention from the fact that the principal owners of the Geneva Tramway Company are Henry A. Butters and John Hays Hammond, who are well known in this country, and because the general manager of the company is H. P. Bradford, formerly general manager of the Cincinnati Inclined Plane Railway Company, and later of the Federal District Railway, of Mexico. The history of the strike, which is nominally still on, though practically over, may be summed up briefly as follows:

An Anglo-American syndicate was organized several years ago to consolidate and equip with electricity the two or three existing tramway and interurban properties at Geneva, and spent about 22,000,000 francs, or \$4,400,000, in carrying out this work, and also in extending the different lines in a number of directions. The first year of operation with electricity produced, however, net earnings of only 1 per cent, and those of the following year showed only 2 per cent on the investment. This was due largely to the retention of antiquated methods of operation on the part of the local manager, who had previously held a similar position with one of the absorbed companies. On Aug. 16 this manager retired, and Mr. Bradford was appointed to the position. The task devolving on Mr. Bradford was recognized as a difficult one, partly on account of the natural antipathy of the working force and public to a foreign manager and partly because of the necessity of introducing a policy of retrenchment as regards the expenses, which, however necessary to the company, was certain to be unpopular with the men.

Symptoms of discontent soon began to be manifested. On Aug. 30 Mr. Bradford and his assistant, Mr. Arthur Schell, posted a bulletin, announcing that after Sept. 14 the services of forty-four employees, who, in their judgment, were unnecessary for the operation of the road, would be dispensed with. As a result of this and on the same evening a meeting was held of the employees, and on Saturday, Aug. 31, a general strike was declared. The employees, after going out on strike immediately adjourned to a photographer's, where a group view was taken. This photograph shows 98 motormen, 98 conductors, 65 car house men, 50 repair shop men, 66 supernumeraries, 50 track men, 12 line men, 30 receivers and inspectors and 20 bookkeepers and clerks, making a total of 489 men on strike.

From the initiation of the strike all important steps in it seem to have been dictated from political motives. The liberal laws of Switzerland, which, for some reasons, are very commendable, have attracted to that country a large number of socialists, who have been driven from other Continental countries, and many of these have made their headquarters in Geneva. The result is that the city is a hotbed of socialists and anarchists, who are strong numerically as well as politically.

The direction of the strikers was at first taken by a prominent local lawyer, Mr. Moosbrugger, who was a publisher of one of the newspapers in Geneva, a radical deputy and municipal councillor, together with an ex-employee, Mr. Gonvers, who is said to have been a motorman on the Versoix line. The sympathies of the public seemed to be at first with the strikers, for it should be said that the strike of Aug. 31 was only the first of two which have occurred on the Geneva system during the last two months. This strike lasted two days. On Sept. 1, after various negotiations, the two parties to the dispute agreed to leave the question to a committee of arbitration to be appointed by the Council of State. The government appointed a commission of three members, viz.: Mr. H. Fazy, president; Mr. Thiébaud, head of the railway department (soon, however, replaced by Mr. Romieux, one of his associates), and Mr. Odier, the attorney general. On Sept. 2, while awaiting the decision of this board of arbitration, the street railway service was recommenced.

On Sept. 12 the decision of the board was rendered, and was favorable to the employees, who obtained the principal points for which they had contended, viz.: return of the forty-four employees who had been discharged and a modification of the rules instituted for their government, and which had been adopted by the new management. An employee by the name of Dumand, who had been particularly obnoxious to the management, having apologized for his actions, was taken back into the service again.

It was believed at the time that the incident was closed, but the results did not justify this favorable interpretation. After several days there were signs of more discontent. With or without reason the employees claimed that the decision of the board of arbitration was not being lived up to by the company. A committee of the employees drew up a series of complaints, and on Sept. 25 they were submitted to the Council of State. The company de-

fended itself against these charges, and after a hearing the government declared its explanations were satisfactory, and that in both letter and spirit the decision of the board of arbitration was being followed by the company. This reply did not satisfy the employees, and on Sept. 27 the committee of employees, headed by Mr. Gonvers, as Mr. Moosbrugger had become disgusted and had retired, declared a second strike.

Although serious in many of its consequences, this strike did not affect the company as much as the first one. On the first day several cars were run out, and this number was increased day by day until Oct. 3, when the entire number of cars used in the service was running. Up to the time of writing this article, however, the night cars had not been put in service. As can easily be assumed these steps were not looked upon with favor by the striking employees, who, being flushed with the success of the first strike, adopted obstructive tactics to prevent the running of the cars. There was considerable rioting, in which a number of cars was smashed, and the militia was finally called out. There were several fights, some fifty soldiers were wounded, a large number of arrests made, and many of the rioters were deported. It was found that nearly all the rioters and strikers were foreigners, and most of them were from Italy.

On Oct. 3 the company announced that it had sufficient employees to operate its cars, and refused to consider the re-employment of any of its former men who were then on strike. The trades unions, which are particularly strong in Switzerland, now took up active sympathy with the strikers, and a general strike of all trades to act in sympathy with the railway strikers was seriously discussed, but no action was taken. In the meantime the canton commissioners issued a proclamation, pointing out the fact that the disturbers of the peace were not natives of the country, and calling on all good citizens to refrain from riotous action or from sympathy with those who were disorderly disposed. The unreasonable demands and turbulent conduct of the ex-employees have had the effect of the withdrawal from them of the sympathy of the intelligent portion of the community, and the reputable gentlemen who, through a misunderstanding of the situation, were drawn into active participation with the employees during the first strike, are now having considerable difficulty in explaining their position satisfactorily to themselves or to anyone else whose opinion is worth having.

## Power Employed in the United States

Census Report (No. 247) on "Power Employed in Manufactures," made by Edward H. Sanborn and Thomas Commerford Martin, expert special agents, has just been issued, and shows a wealth of most interesting information as well as most painstaking and careful research in its compilation and arrangement. It is impossible to reproduce any of the many and valuable tables presented in this report, but a few statistics will be quoted.

The report, for instance, shows that the aggregate motive power employed in manufacturing establishments in the United States during the census year was 11,300,081 hp, as compared with 5,954,655 hp in 1890, 3,410,837 hp in 1880, and 2,346,142 hp in 1870. Of the total power used in manufactures during the census year, steam engines furnished 8,742,416 hp, or 77.4 per cent of the aggregate; water-wheels supplied 1,727,258 hp, or 15.3 per cent; electric motors, 311,016 hp, or 2.7 per cent; gas and gasoline engines, 143,850 hp, or 1.3 per cent, and other forms of mechanical power 54,490 hp, or 0.5 per cent. In addition to the power noted, which was generated by the establishments by which it was used, rented power was used to the extent of 321,051 hp, or 2.8 per cent of the total. Of this rented power 183,682 hp was electric, and 137,369 hp was other power.

During 1900 over 1200 electric railway lines were in operation in the United States, and the total capacity of their power plants exceeded 1,000,000 hp. There are over 3300 central stations for the distribution of electric current for lighting and power purposes, and the total amount of steam power used to generate it is estimated to be more than 1,500,000 hp.

As shown steam still continues to be pre-eminently the primary power of greatest importance, and the census returns indicate that the proportion of steam to the total of all powers has increased very largely in the last thirty years. The increase in the case of gas engines, however, from 8930 hp to 143,850 hp, a gain of 134,920 hp, is proportionately the largest increase in any form of primary power shown by a comparison of the figures of the eleventh and twelfth censuses, amounting to 1,510.9 per cent. The average horse-power per gas engine in 1900 was 9.7 hp.

The total amount of waterpower reported as used by manufacturing establishments in 1900 was 1,727,258 hp; 1,263,343 hp in 1890; 1,225,379 hp in 1880, and 1,130,431 hp in 1870.



## London Letter

(From Our Regular Correspondent.)

The Central London Railway, having experimented with exhaustion fans as a method of removing the foul air from the tube, has decided that such a method is not successful, and will now endeavor to improve the atmosphere by forcing fresh air into the tube from the outside, through numerous pipes throughout the length of the tube provided with taps by which even distribution will be accomplished.

It is now stated that an influential English syndicate is promoting a line to run under the Central London Railway from the city to the Marble Arch, at which place it is to connect with a line called the Northwest London Railway, authorized two or three years ago, to run from the Marble Arch to Cricklewood. It may be taken for granted that the scheme will be opposed by the Central London Company, but the promoters of the bill will no doubt point out that the "two-penny tube" is already crowded with traffic during the business hours, and that, therefore, it could not properly accommodate the passengers of the Northwest London Railway if that line were to be made simply as a branch from the Marble Arch.

Arrangements have been entered into by the Corporation of Warrington and the South Lancashire Tramways Company, whereby their respective lines will be joined together on the boundaries of Warrington and Winwick. The Corporation of Warrington is just completing their portion of the work, and on the Tramways Company completing theirs it will be possible for the general public to travel along the roads from Warrington to Bedford Leigh, St. Helens, Prescott, Liverpool and vice versa. Eventually it is intended that there shall be a continuous tramway route between Liverpool, St. Helens, Wigan, Warrington, Bolton and Manchester.

The Great Yarmouth electric tramways, which were laid down early in the summer at a cost of £40,000, have just completed the first quarter's working. The takings during that period amounted to about £4,100, and the profits have reached £2,125 for the three months. The Council now contemplates laying down some 3 miles of additional lines.

A contract to the value of half a million sterling has been placed with the British Westinghouse Electric & Manufacturing Company, London, by the Clyde Valley Electrical Company, Glasgow, for the equipment of their two generating stations, which are to supply electrical power for industrial purposes over an area of 755 square miles. The station will be ready in about eighteen months' time.

It is anticipated that early next year the electric trams of Sheerness will be in active operation. The work of laying the rails, erecting the trolley poles and constructing the generating station is satisfactorily proceeding. The cars will be capable of seating fifty passengers, and will be fitted with reverse staircases similar to those on the Chatham cars. The trolley, however, will be different. The overhead wires are at a considerable height, and the current will be collected from them by means of the Siemen bow. There will be about 2½ miles of lines, the gage being a narrow one, and the line economically laid. The Kent Electric Power Company have the scheme in hand, the contractors being Messrs. J. G. White & Co., of London.

Engineers have recently been engaged on behalf of the British streets in Coatbridge and Airdrie with a view to starting operations in laying the tramway lines in these burghs. It is intended that operations will commence at or about Christmas in both towns, and that the tramways will be open for traffic in about four months thereafter. The company intend laying the line all the way from the west end of Coatbridge to Clarkson Church in the east end of Airdrie, and not, as was feared, stopping at the Carlisle Road.

The fight for and against the municipalization of tramways in Birmingham and the Midlands goes on with increased keenness as the time of the municipal elections approaches. The retiring councillors and their opponents are making the question a test. While Birmingham is divided as to whether the corporation or the British Electric Traction Company should be supreme, Walsall has made up its mind that municipalization is the only course.

The highways and sewers committee of the Burton-on-Trent Corporation have, on the recommendation of their electrical advisers, Messrs. Kincaid, Waller and Manville, of London, decided not to proceed further with the question of adopting the Loraine or surface contact stud system for tramways, in use at Wolverhampton, but to go on with the original scheme of overhead trolley wires.

The stimulating results of competition have been evidenced in Liverpool by the development of the electric tram system. Prior to the introduction of the cars the Overhead Railway Company,

itself an electrical undertaking, had a practical monopoly of the passenger traffic along the dock line, having itself "knocked out" the horse omnibuses. The advent of the electric trams has now exercised so serious an effect upon the traffic of the Overhead Railway that the directors of the latter undertaking had to boldly face the situation. The consequence has been a remarkable acceleration of the train service, which was inaugurated yesterday by some trial runs and an inspection of the railway and its equipment generally. Sir William Forwood, the chairman, and a numerous company of guests attended. The speed now attained is 19 miles an hour, including stoppages, which is stated to largely exceed the speed of numerous similar railways both in this country and in the United States. The new equipment has been furnished by Dick, Kerr & Co.

The Ipswich Town Council have accepted tenders in connection with the scheme for applying electricity to the tramway system and the erection of a dust destructor amounting to £105,143. The dust destructor and chimney shaft represent about £9,000 of this amount. The total mentioned does not include the cost of street widenings, or of cars, etc., and Mr. Jervis, the chairman of the committee, states that the total cost of the new tramway scheme will be about £200,000.

A company has been formed for the purpose of obtaining powers for constructing an electric tramway between Cardiff and Penarth. The directorate comprises some prominent local commercial gentlemen, and there is every reason to believe that the venture, if it receives the sanction of the Board of Trade, will prove a financial success, and certainly it would be a public convenience.

The work necessary for the substitution of electricity for steam on the Mersey Tunnel Railway is progressing rapidly, and it is confidently anticipated that the service will be completely transformed and electric trains running through the tunnel by the first week in December. The work of equipping the railway is being done by the British Westinghouse Electric & Manufacturing Company, under the direction of Mr. J. W. Cooper, but the traffic upon the completion of the transformation will be conducted and controlled by the staff of the Mersey Railway Company. At present no definite service at an increased speed has been arranged, but a more frequent service of trains is assured. Trains can be run through the tunnel at 3-minute intervals, but this will only be done if the traffic demands justify it. The trains can be driven at a speed of 50 miles an hour, but it is intended at first to allow 11 minutes for the trip between Liverpool and Rock Ferry, with stops at each station on the route. While on this question it should be noted that the cars are to be fitted with the Westinghouse compressed air brake, which is absolutely automatic in case of a failure in the motor or current. The signals will be worked by hand as at present, but possibly an electric automatic device may be utilized in the future.

As a result of the severe competition of the Glasgow electric tramways to the suburban districts of Glasgow, the Glasgow & Southwestern Railway Company announce that they intend to withdraw their suburban trains. Last half-year the railway company carried a quarter of a million fewer passengers, three-quarters of the reduction being in the suburban traffic.

At different points along the Cardiff electrical tramway system what are known as time recorders are being fixed. In addition to serving the useful purpose of denoting the time to the public, they act as a check on the drivers and conductors, the last-named having at the end of each journey to apply a key to a certain piece of mechanism, and this indicates how long it has taken to travel to and from various points.

Mr. E. Rotter, A. M. I. C. E., has been appointed as consulting engineer to the corporation of Rochester for their proposed tramway scheme.

Mr. Theodore Beran, assistant commercial manager of the British Thomson-Houston Company, Ltd., of Rugby, was given a complimentary dinner Oct. 1 by a number of his colleagues at the Rugby works, as a mark of their appreciation, prior to his departure for New York, and to assure him of a cordial welcome on his return to Rugby, which will probably be before the end of the year. Speeches were made by Messrs. Walton, chief engineer of the company; Beran, Doverhill, Churchill, Wallis, Swift, Clark and Phipps.

Electrical circles in London, and in fact throughout the world, have been deeply moved to learn of the untimely demise of Professor Sidney H. Short, who has for the past three or four years been acting as technical director of Messrs. Dick, Kerr & Co., of London. Mr. Short had established for himself an enviable reputation in England in connection with the almost unprecedented success and phenomenal growth of Dick, Kerr & Co.'s electrical business, and had surrounded himself with a large and influential circle of friends. Mrs. Short, who has always taken an active interest in Mr. Short's success, had also made a



social position for herself in London, and has our most sincere sympathy in her sad bereavement. Reference has already been made to Mr. Short's work in another article. A. C. S.

**Recent Annual Reports**

The eighth annual report by the Tramways committee of the Town Council of Glasgow for the year ended May 31, 1902, shows the following statement:

	Electric Traction			Horse Traction			Total		
	£	s.	d.	£	s.	d.	£	s.	d.
Traffic receipts .....	582,145	16	6	30,680	5	10	612,826	2	4
Other receipts .....	1,092	17	11	494	4	8	1,587	2	7
Totals .....	583,238	14	5	31,174	10	6	614,413	4	11
Working expenses (inc. depreciation)	373,174	4	3	31,928	16	4	405,103	0	7
Balance to net revenue account....	Surplus 210,064 10 2			Deficit 754 5 10			209,310 4 4		

Total amount carried to net account ..... £209,310 4 4

Which has been applied as under:—

Interest and sinking fund, etc., on cost of Govan & Ibrox Tramways .....	£ 5,057	3	10						
Interest on capital.....	54,282	17	10						
Sinking fund.....	36,974	15	9						
Sinking Fund.....	36,974	15	9						
Payment to common good....	12,500	0	0						
							108,814	17	5

Net balance added to general reserve fund..... £100,495 6 11

The amount of the capital account on June 1, 1901, as reduced by depreciation, was £1,793,934 8s. 1d. To this sum falls to be added £408,043 7s. 10d., being the net amount expended on capital account during the year, and there falls to be deducted (1) £67,402 1s. 2d., being the amount of depreciation written off for the year, and (2) £93,539 15s. 9d., being the amount written off against the general reserve fund. The net amount expended on capital account, as at May 31, 1902, was therefore £2,041,035 19s. 0d.

The total amount borrowed for capital purposes is now £1,884,605 12s. 7d., of which £260,500 was borrowed during the past year.

The following general remarks will be of interest: The last horse cars were withdrawn from service April 14, 1902, so that this is the last annual report in which the horse traction account will appear. The company now has 536 electric passenger cars.

Throughout the summer months of 1901, the International Exhibition created a very large traffic. During the week ended Sept. 28, 1901, the number of passengers carried reached 3,724,037, and the traffic revenue amounted to £14,277 11s. 3d. This constitutes a record for the department.

On Aug. 19, 1901, the committee reduced the working hours of motormen and conductors and other members of the traffic staff from ten hours to nine hours per day without any reduction in wages.

On April 3 the Corporation approved of the recommendation that the penny stage be extended to cover any four consecutive halfpenny stages, instead of three. The average length of the halfpenny stage is slightly over half a mile, or .58, so that the average length of the penny stage is now 2.32 miles. This change came into operation on June 1, 1902.

The financial results of electric traction as compared with horse traction have, so far, been entirely satisfactory. Although the car mileage has been very much increased, the average revenue per mile has slightly increased, being 11.90d against 11.82d and 11.55d for 1901 and the two preceding years. The working expenses, amounting to 5.30d per car mile, or, including amounts set aside for depreciation and permanent way renewal, 7.51d, are about 2d per mile less than the working expenses under horse traction.

The report of the Manchester Corporation Tramways for the year ended March 31, 1902, is given in abstract below:

	Car Mileage	Passengers Carried	Receipts			Average Receipts per Car Mile
			£	s.	d.	
Electric traction .....	1,684,345	21,443,188	85,631	15	5	12.20
Horse traction .....	146,781	2,147,100	5,987	12	11	9.79
Total.....	1,831,126	23,590,288	91,619	8	4	12.00

**New Publications**

A Manual of Drawing, by C. E. Coolidge. 92 pages, 10 full page plates. Price, \$1.00. Published by John Wiley & Sons, New York, 1902.

This manual is intended to put in permanent form a drafting room system that may be accepted as standard, and thus tend to relieve the student of unnecessary burdens. It is recognized that the student should not be looked upon as an experienced commercial draftsman, and to facilitate his advancement in this department, it is proposed to surround him, as far as possible, with the atmosphere and sensation of the commercial drafting room and teach him at least one good system well. It is not claimed that the system elaborated in this book is complete, but it is intended to present a fair average drafting room system, such as are in use in this country. The work incorporates much data and other information that have been received from the leading manufacturing concerns of the United States.

Electrical Street Railways, by Edwin J. Houston, Ph. D., and A. E. Kennelly, Sc. D. 367 pages. Price, \$1.00. Published by the Electrical World and Engineer, New York, 1902.

This is a reprint of the popular work of Messrs, Houston and Kennelly, which has found so much favor among students and practical electric railway men. It is presented in convenient form, and is well arranged and illustrated with drawings and half-tones of the machines described.

The Electric Motor and the Transmission of Power, by Edwin J. Houston, Ph. D., and A. E. Kennelly, Sc. D. 377 pages. Price, \$1.00. Published by the Electrical World and Engineer, New York, 1902.

This is a reprint of the valuable work on electric power transmission, which formed one of the most popular volumes of the electro-technical series prepared by these authors.

**A Unique Periodical**

In its monthly magazine, The Four-Track News, the passenger department of the New York Central & Hudson River Railroad has created a decided novelty in the journalistic field. If the publication had been originated and conducted by anyone else than George S. Daniels, it would doubtless have been referred to generally as the "house organ" of the New York Central lines, and its circulation would necessarily have been entirely gratuitous. A might be expected of Mr. Daniels, however, a broad-minded editorial policy has been adopted and The Four-Track News is no mere "house organ," but an interesting and valuable magazine, both for regular and occasional travelers, whether living within the territory covered by the New York Central lines or not. The Four-Track News is 50 cents a year, five cents a copy, and can be had of George H. Daniels, general passenger agent, publisher, Grand Central Station, New York.

**Peculiar Accident on High-Speed Road**

A peculiar accident happened the other night on the road of the Columbus, Buckeye Lake & Newark Traction Company to a motor car going west from Newark toward Columbus, about 9:30 o'clock. Some malicious person had tied a rope to a large stone and threw the other end of the rope up over the trolley wire. As the car was going at a rate of about 25 miles an hour, the stone went through the front window, striking the motorman on the head and knocking him off the stool. The cars are equipped with the General Electric multiple controller, and it is necessary at all times for the motorman to hold down the spring on the handle. As soon as his hand was removed from this spring the power was cut off; consequently the car stopped. The conductor, after giving two bells to proceed and receiving no response, went through the car to the front end and found the motorman lying unconscious in the vestibule.

J. R. Harrigan, the general manager of the company, says that but for this precautionary device the car would have probably run off the track at the approaching curve, and might possibly have run into the canal.

In the opinion of the San Francisco Post the proposition to issue bonds to the extent of \$700,000 for the construction of a municipal railway on Geary Street, that city, "is one of the most important which has been submitted to our people since the adoption of the constitution in 1879." What a beautiful example the Post is of the rabid municipal ownership advocate, foaming at the mouth, and, in the vernacular of the street urchin, throwing fits.



**A Decision on Interurban Roads in Ohio**

Judge Harter, of the Common Pleas Court, at Canton, Ohio, has handed down a decision upon the status of interurban lines, which, if sustained by higher courts, will render municipal councils practically helpless in dealing with them. Recently the Stark Railway Company served notice on the Canton Council that it found it necessary to construct a terminal loop in the business section of Canton. After opposition the Council made the grant as to a railway company. A propertyowner immediately filed an injunction suit, claiming the road could not take advantage of the rights granted to railways. The court decided in favor of the plaintiff, holding that as an interurban electric railway it was not necessary for it to go through the ordinary course pursued by city lines to secure a franchise for a loop over city streets, and that such a line could proceed in the same manner as a steam road and appropriate the right of way and pay the property-owners any damages that a jury would allow.

**Street Railway Patents**

UNITED STATES PATENTS ISSUED OCT. 21, 1902

[This department is conducted by W. A. Rosenbaum, patent attorney, Room No. 1203-7 Nassau-Beekman Building, New York.]

711,646. Buffer for Railway Cars; W. F. Richards, Buffalo, N. Y. App. filed March 10, 1902. A buffer, supported by springs in such a manner as to remain in contact with its mate while the car passes curves of short radius.

711,753. Protecting Rail for Open Cars; C. E. Baltz, Rahway, N. J. App. filed July 16, 1902. The guard rail is pivoted to the side of the car by means of links and rollers in such a way that one man can shift the rail.

711,832. Adjustable Side Bearing for Cars; L. C. Denison, Anaconda, Mont. App. filed June 26, 1902. A box having an opening through one of its walls for the admission of shims and a bearing block resting in the box and on the shims therein.

711,842. Car Seat; H. L. Flint, Cambridge, Mass. App. filed Jan. 2, 1902. An automatic locking device for the seat and a connection between the seats of twin seats, whereby they are caused to rotate in unison.

711,861. Truck for Street Cars; R. H. Hornbrook and W. H. Woodcock, Canton, Ohio. App. filed April 22, 1902. The truck has open side trusses, consisting of an arched upper cord, a horizontal lower cord and interposed struts, all of ordinary commercial shapes.

711,867. Portable Electrically Illuminated Sign; H. S. Kemp, Richmond, Va. App. filed Feb. 25, 1902. The sign, with its lamps mounted on a frame, can be bodily removed from the car and replaced without deranging the circuits.

711,868. Illuminated Sign; H. S. Kemp, Richmond, Va. App. filed Feb. 25, 1902. A modification of the preceding patent.

711,878. Car Starting Device; F. B. Nims, Lake Odessa, Mich. App. filed Feb. 28, 1902. The shoe in which the lever is pivoted is provided with a peculiar clamping device to hold it on the rail.

711,890. Car Brake; L. C. Johnson and W. S. Johnson, Detroit, Mich. App. filed June 27, 1902. Details.

711,915. Car Brake; R. H. Wakeman, Brockroad, Va. App. filed Aug. 25, 1900. Details.

UNITED STATES PATENTS ISSUED OCT. 28, 1902.

712,011. Car Brake; J. S. Sheets, Philadelphia, Pa. App. filed Nov. 22, 1901. The brakes are connected in pairs and operated in



PATENT NO. 712,333

unison by a toggle mechanism. Means whereby the brake hanger is clamped to the cross-tie.

712,131. Insulated Rail-Joint; G. L. Hall, Brooklyn, N. Y. App. filed Jan. 18, 1902. Consists of a two-part fish-plate. Means for uniting the two parts and means for insulating the two-rail ends and the two parts of the fish-plate from each other.

712,132. Insulated Rail-Joint; G. L. Hall, Brooklyn, N. Y. App. filed Feb. 12, 1902. Consists of a two-part fish-plate in combination with an angle chair. Means for insulating the two parts of the fish-plate from each other and of the angle-chair from one of the rail ends.

712,181. Side Bearing for Railway Cars; F. R. Cornwall, St. Louis, Mo. App. filed March 10, 1902. A side bearing having a support provided with a circular hub flange, a roller provided with a flange extending over said hub flange, and anti-friction devices interposed between the hub flange and roller flange.

712,224. Side Bearing; C. H. Williams, Jr., Chicago, Ill. App. filed March 31, 1902. The bearing has a divided spindle journaled therein, and rollers arranged on the ends of the spindle.

712,281. Device for Lessening the Noise of Vibration in Vehicles; H. G. Farr, Winchester, Mass. App. filed Feb. 14, 1902. A copper wire covered with non-vibrating material is coiled about the axle, the ends of the wire being bared and rigidly secured to the axle adjacent opposite ends thereof.

712,320. Expansion Joint Coupling for Track Rails; J. W. McBurney, Fort Palmer, Pa. App. filed June 27, 1902. A flat bar having a dove-tail tongue on one side, lateral enlargements on the ends of the tongue to engage T-slots in the track-rail webs and a laterally-flanged locking plate, having a laterally-open channel dove-tailed in cross section, that is adapted to receive the dove-tail member of the tongue.

712,333. Electric Railway Signal; C. V. Richey, Washington, D. C. App. filed April 8, 1902. One of the track rails forms a continuous conductor, the other rail being divided into blocks or sections having batteries at the junction of each section. Each battery has one pole connected to the end of one section and the other pole to the contiguous end of the next section. The ends of a section are connected to similar poles of adjacent batteries, whereby the sections are alternately negative and positive, the signals being in circuit with each battery, and the circuit being closed through the trucks of the cars.

712,430. Railway Signal; G. L. Wilson, Chicago, Ill. App. filed Sept. 16, 1901. A wire is attached to the support of a bridge or culvert and to a signal light; tension on the wire, caused by displacement of the rail-supporting structure, causes the signal light to be exposed.

**PERSONAL MENTION**

MR. J. L. GREATSINGER, president of the Brooklyn Rapid Transit Company, has recently returned from a vacation of several weeks.

MR. M. H. SHERMAN, vice-president of the Los Angeles Pacific Railway Company, of Los Angeles, Cal., has returned to California after a short trip to the East. Mr. Sherman visited New York, Washington, Niagara Falls, Quebec and several other large cities, and in Vermont looked over the home of his boyhood days at Lake George.

MR. GEORGE F. CHAPMAN, formerly of the North Jersey Street Railway Company, and now general manager of the United Railways of San Francisco, has recently had dedicated to him a march by Horst, entitled "The United Railroads." This piece of music has become very popular in San Francisco, and is being played by the Golden Gate Park Band at Golden Gate Park.

MR. O. W. BRAIN, electrical engineer of the New South Wales Railways & Tramways department, succeeded the late Mr. P. B. Elwell in this position, and not Mr. G. Fischer, as stated in the September issue, Mr. Fischer having been, before he severed his connection with the government engineering force, supervising civil and mechanical engineer for tramway construction.

MR. E. C. MILLS, of E. W. Mills & Co., Ltd., Wellington, New Zealand, is spending some time in this country on a business trip. Mr. Mills' firm is an extensive dealer in general machinery and supplies in New Zealand. While in this country Mr. Mills will arrange for purchases, in behalf of his firm, of electrical and other machinery. His address while in New York is care of the Livingston Nail Company, 104 Reade Street.

MR. JAMES T. ROOD, formerly electrical engineer of the Natural Food Company, of Niagara Falls, N. Y., has accepted a position with the Worcester Consolidated Street Railway Company in the department of motive power and machinery. Mr. Rood is a graduate of the Worcester Polytechnic Institute, class of 1898, and previous to his work with the Natural Food Company was employed by the General Electric Company at the Lynn factory, the Bernstein Electric Company, of Boston, and the Worcester & Holden Street Railway Company.



## FINANCIAL INTELLIGENCE

### THE MARKETS

#### The Money Market

WALL STREET, Nov. 5, 1902.

Thanks to the energetic measures of the Secretary of the Treasury the money market has regained a comparatively normal condition. Purchases of government bonds, under the terms of the recent Treasury circular, have been sufficient to place to the credit of the New York banks nearly \$22,000,000 during the past fortnight. This, together with forwardings of gold arriving at Pacific coast ports, has added so liberally to the cash holdings of the local institutions that their surplus reserve now stands at the comfortable sum of over \$21,000,000. Not only is this twice as large as was held a year ago, but it is considerably above any recent average for the surplus item at this season. Reflecting this rapid resuscitation of resources, money on call has loaned freely between 4 and 5 per cent, and time loans are in much better supply, with even some concessions noted from the schedule rate of 6 per cent for all dates. The offerings of this class of accommodation at the moment are perceptibly greater than the demand. Nevertheless, it would be rash to assume that the main problems which have hung over the money market for the past two months have been solved. The Treasury still continues to draw out much more in customs and internal revenue receipts than it pays out in ordinary government expenditure, and while the outgo to the interior is visibly slackening, there are as yet no signs of a complete check. Moreover, the great uncertainty remains of how much of our unpaid debit balance abroad will have to be settled in gold. That we shall be called upon to ship gold freely between now and Christmas is practically certain. Sterling exchange, after a brief period of reaction last week, has again reached the high level of the season, and is very close to the gold-shipping point. No opinions are expressed among authorities, however, as to what sum will have to go out in order to relieve the present strain in the exchange market. Much depends upon the volume of our grain exports, which are at length beginning to increase in something like a normal manner. The probabilities, summing the situation up, are that no further relaxation will occur in the money market, but, on the contrary, that the demands upon local bank reserves will be such as to harden rates again before the end of the year.

#### The Stock Market

Stock speculation has been influenced during the past fortnight by the gold export probabilities and by the uncertainty of the Congressional election, the latter having a closer bearing upon the daily movement than the former. The general run of Wall Street sentiment has been bearish, and operations have been conducted on the short side more freely than on the long side. As the larger financial interests have been content to leave the market to itself, their attitude has been construed in some quarters as an indication that they consider prices high enough, and are not prepared to encourage a further rise. This undoubtedly has made the outside public more timid, and at the same time has induced some liquidation of outside holdings. But whether these unfavorable inferences regarding the views of the leaders are correct or not, is something that still remains to be proved. Many shrewd persons are inclined to think that the big financiers and operators are merely biding their time, awaiting a clearer outlook in the money market, and that they will, at the proper moment, launch out on a new campaign for higher prices. This theory finds support in the obvious fact that stocks are, for the most part, very strongly held. Now that the election uncertainty is out of the way the chances favor more activity, at least in speculative circles, than has been witnessed during the past two weeks. The fear of a labor outbreak among the Western railway employees, which gained some ground a fortnight ago, has disappeared under the assurances that the men will probably get a part of what they demand. But there is still an uneasy feeling in many quarters over the signs of a more aggressive spirit on the part of the labor unions, which have come more into evidence since the partial success of the union coal miners.

Manhattan Elevated has been the feature of the local traction group, and for that matter one of the leaders in the general market during the recent trading. It seems to be quite certain that the stock is getting more active support from the insiders than it has enjoyed for a very long time. Apparently it is the intention of these powerful interests to make the introduction of the electric service on the West Side lines the occasion for directing attention afresh to the improved earnings and prospects of the

road under the electric installations. Predictions are freely made on the Stock Exchange that the price of Manhattan will soon cross that of Metropolitan. The latter stock, however has been benefited by the recent rise in the elevated shares. Brooklyn Rapid Transit also appears to occupy a better position in the market than it did before the recent quarterly report was published, with its encouraging show of increasing net earnings.

#### Philadelphia

Local traction stocks in Philadelphia have shown noteworthy strength despite the uncertain course of the general market. Activity in the recent dealings has been confined chiefly to American Railways, Philadelphia Rapid Transit and Union Traction. In all these issues a fair volume of business has been done, on a rising level of prices. Rapid Transit has advanced to 18½, which once again is the high record, the movement being accompanied by definite statements that earnings of the lessee company are running at least \$4,000 a day ahead of a year ago. American Railways has also reached a new top price, at 53½, anticipating what many people believe to be a reasonable probability, that the dividend on the shares will soon be raised. Union Traction has made less advance than the other members of the active trio, most of the recent transactions occurring around 47¼. A feature of the past week has been a further sharp advance in Indianapolis Street Railway from 87 to 90. This is a net gain of 50 points since last spring. No other reason is discoverable for the movement than that all the available stock is being bought in, in connection with the consolidation schemes in the Indiana trolley field. Sales of Union Traction, of Indiana (138 shares), were reported last Saturday at 54. Other transactions of less importance are to be noted in Consolidated Traction, of New Jersey, at 69¾, Philadelphia Traction at 98¼, and a small investment lot of Germantown & Norristown at 174. Bond sales of the last two weeks comprise Consolidated Traction, of New Jersey 5s, at 110 to 110½, Electric-People's Traction 4s at 98¼, People's Passenger 4s at 105, United Railways 4s between 89 and 89½, American Railways 5s at 107¾, and Wilmington & Chester Traction 5s at 105.

#### Chicago

Despite vigorous denials there is excellent ground for the statement that negotiations for the reorganization of the finances of the Union Traction Company are under way. Our informant in Chicago says that he obtains the information from a high source, that action must soon be taken, although just what the plan will be is not divulged. Union Traction shares have moved rather uncertainly in the recent market, but with a fairly strong undertone. The common, after selling down to 16½, recovered to 17½. Only a few odd sales of the preferred are reported, at 48. It was said that the South Side Elevated, after election, would ask for the right to construct a third track to Forty-Third Street. The stock has been strong at 110. Metropolitan issues have also been in demand, the common moving up from 39¾ to 40%. It is calculated that the road, when all its feeders are in operation and its new downtown terminal completed, will be in a position to earn the full 5 per cent on the preferred stock, and also be able to pay something within the next year on the common. Earnings of both surface and elevated lines are keeping up remarkably well. The only other noteworthy transactions beyond those already recorded, comprise Northwestern Elevated common from 34½ to 35, City Railway at 212, West Chicago from 94½ to 92¼, and Lake Street at 9%.

#### Other Traction Securities

Boston traction issues have pretty closely followed the course of the general market in the recent trading, and have, therefore, been dull and rather depressed. Massachusetts Electric common, after selling up to 39, dropped off to 37¾, and the preferred reacted from 96 to 95, Boston Elevated, on fractional lots, went down two points, to 154, and West End remained barely steady at 93½. In Baltimore also business has been dull. United Railways common at 14, the income bonds at 68¼, and the general 4s at 94¾ to 95, are the quotations at which all the transactions have been made. Nashville Railway common fell from 5½ to 5, and then recovered to 5¼. Nashville certificates sold down from 77½ to 77%, but later recovered the loss. Fifty shares of Lexington Railway sold at 50. The only bond sales reported, other than those just mentioned, were Baltimore Traction 5s at 118½, City Passenger 5s at 108, and Atlanta Street Railway 5s at 106½.

Traction sales on the Cleveland Exchange numbered only 1740 shares last week, as compared with 3974 shares for the week before. Lake Shore Electric opened at 17, and dropped suddenly to



15, upon the report that an assessment of \$6 to \$10 per share was contemplated. This was promptly denied by the financing committee, but the uncertainty regarding the future of the property and the prospects of an increase of the preferred issue, held the stock at the low mark. Sales number 640 shares. Two fifty-share lots of Cleveland, Painesville & Eastern sold at 33 $\frac{1}{8}$  and 35, the first in a long time. Cincinnati, Dayton & Toledo sold to the extent of only 200 shares; range from 40 $\frac{3}{4}$  to 41 $\frac{1}{2}$ . Aurora, Elgin & Chicago common sold at 39 $\frac{3}{4}$  and 38 $\frac{1}{4}$ , a trifle higher than former figures. Northern Ohio Traction common fluctuated between 63 and 64, on sales of 210 shares. Monday the only sales were 100 Western Ohio, at 29 $\frac{1}{2}$ , and 100 Northern Ohio Traction preferred at 93 $\frac{1}{4}$ , equal to the previous sale. At Toledo several blocks of Toledo & Western bonds were sacrificed, and the price was forced down from 93 to 87. At that figure the bonds were eagerly taken by prominent financial men.

**Security Quotations**

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week:

	Closing Bid	
	Oct. 21	Nov. 3
American Railways Company	52 $\frac{1}{2}$	53
Aurora, Elgin & Chicago	37	38
Boston Elevated	155 $\frac{3}{4}$	152
Brooklyn R. T.	63	62 $\frac{3}{4}$
Chicago City	212	212
Chicago Union Tr. (common)	18	16 $\frac{1}{2}$
Chicago Union Tr. (preferred)	50	47
Cleveland Electric	86	85 $\frac{1}{2}$
Columbus (common)	56	55 $\frac{3}{4}$
Columbus (preferred)	106	105 $\frac{1}{2}$
Consolidated Traction of N. J.	69 $\frac{1}{2}$	69 $\frac{3}{4}$
Consolidated Traction of N. J. 5s.	110 $\frac{1}{4}$	110 $\frac{1}{2}$
Detroit United	88	87
Electric People's Traction (Philadelphia) 4s.	98 $\frac{1}{4}$	98 $\frac{1}{4}$
Elgin, Aurora & Southern	55	a59
Indianapolis Street Railway 4s.	87	88
Lake Shore Electric	15	13 $\frac{1}{2}$
Lake Street Elevated	9 $\frac{7}{8}$	9 $\frac{3}{4}$
Manhattan Railway	134 $\frac{3}{4}$	136 $\frac{3}{8}$
Massachusetts Elec. Cos. (common)	38	37 $\frac{1}{2}$
Massachusetts Elec. Cos. (preferred)	95	95 $\frac{1}{2}$
Metropolitan Elevated, Chicago (common)	40 $\frac{3}{4}$	40
Metropolitan Elevated, Chicago	88 $\frac{1}{2}$	88 $\frac{1}{2}$
Metropolitan Street	139 $\frac{1}{2}$	140 $\frac{1}{2}$
New Orleans Railways (common)	17	—
New Orleans Railways (preferred)	53 $\frac{1}{2}$	—
North American	121 $\frac{1}{2}$	123 $\frac{3}{4}$
Northern Ohio Traction (common)	63 $\frac{1}{4}$	a66
Northern Ohio Traction (preferred)	92	93 $\frac{1}{2}$
North Jersey	33 $\frac{3}{4}$	—
Northwestern Elevated, Chicago (common)	34 $\frac{1}{2}$	34 $\frac{3}{4}$
Philadelphia Rapid Transit	17 $\frac{7}{8}$	18
Philadelphia Traction	98	98
St. Louis Transit (common)	—	28 $\frac{1}{2}$
South Side Elevated (Chicago)	110	108
Syracuse Rapid Transit	a31 $\frac{3}{4}$	32
Syracuse Rapid Transit (preferred)	a78 $\frac{3}{4}$	a78
Third Avenue	127	126
Toledo Railway & Light	a38	a40
Twin City, Minneapolis (common)	120	118
United Railways, St. Louis (preferred)	—	—
United Railways, St. Louis, 4s.	85 $\frac{5}{8}$	—
Union Traction (Philadelphia)	47	47 $\frac{3}{8}$
Western Ohio Railway	29	27

a Asked.

**Iron and Steel**

The iron market has been concerned during the past two weeks by the sharp cutting of price schedules in some of the manufactured forms, notably in wire, nails and sheet steel. It is given out that the competition of outside concerns has forced the Steel Corporation to make these reductions. But, while this has naturally aroused some uneasiness as the first sign of any sort indicating reaction in the iron trade, it does not appear that any of the other branches have been at all affected. Pig iron furnaces are running at full capacity, and their output is sold ahead for over six months. The steel market is in an equally strong position. Quotations are as follows: Bessemer pig \$21.75 and \$22.00, steel billets \$31.50 to \$32.00, steel rails \$28.00.

**Metals**

Quotations for the leading metals are as follows: Copper, 11 $\frac{1}{8}$  cents; tin, 26 $\frac{1}{2}$  cents; lead, 4 $\frac{1}{8}$  cents, and spelter, 5.45 cents.

BIRMINGHAM, ALA.—It is said that the Alabama Steel & Wire Company, which plans to build a big blast-iron furnace and steel plant at Gadsden, has purchased the Gadsden Ice Company, Gadsden Electric Light Company, and Alabama City, Gadsden & Attalla Electric Railway.

CHICAGO, ILL.—It is reported that plans are being considered for a complete financial reorganization of the Chicago Union Traction. From one source it is said that the plan is to scale down the fixed charges by asking the consent of the stockholders, while from another source it is said that a plan is being considered to replace all various guaranteed stocks and various bonds by new 4 per cent bonds.

WESTBORO, MASS.—The Westboro & Hopkinton Street Railway Company has petitioned the Railroad Commission for its approval of an issue of bonds to the amount of \$40,000.

WORCESTER, MASS.—The annual statement of the Worcester Consolidated Street Railways Company's earnings, made for the purpose of apportioning its excise tax, shows that the gross earnings were \$1,203,248. This is more than \$50,000 greater than last year. The earnings average \$9,262 for each of the 129,899 miles of track operated. The company pays an excise tax of \$27,073, or \$208.41 on each mile of track. The Massachusetts statutes provide for the excise tax to be 2 $\frac{1}{4}$  per cent of the gross earnings of the company, which is divided among the cities and towns in which it has locations, according to the mileage of tracks. In addition to the excise tax of \$27,073 the company has to pay a corporation tax of \$28,488, and a tax of \$15,331 on real estate, making its total tax \$80,892. The corporation tax is \$11,905 greater than last year.

ONSET BAY, MASS.—Application has been made for the appointment of a receiver for the East Wareham, Onset Bay and Point Independence Street Railway Company, looking to the dissolution of the company. The company's rights and privileges are now enjoyed by the New Bedford & Onset Street Railway Company, and this action is taken to close up the affairs of the old company, which operated the line of horse cars between East Wareham and Onset.

NORTH ADAMS, MASS.—The annual financial statement of the Hoosac Valley Street Railway Company shows that the earnings from passenger traffic were \$110,543, and the operating expenses \$83,000. More than \$13,000 was expended during the year for repairs on roadbed and track, \$8,000 for repair on cars and equipment, and \$21,000 for power. The expenditure for wages of employees was \$24,000. The company added to its property, such as cars and electrical equipment, overhead construction and additional land and equipment at the power station, for which it expended \$184,000.

DETROIT, MICH.—It is generally believed that the deal for the sale of the Detroit & Toledo Shore Line to the Grand Trunk Railway (steam) has fallen through as nothing has been heard of it for several weeks. It is thought that the Detroit United Railway Company will take up the proposition, and place the road in operation.

HELENA, MONT.—The Federal Trust & Savings Bank has been made trustee under the mortgage securing an issue of \$500,000 6 per cent bonds of the Helena Light & Traction Company.

NEW YORK, N. Y.—It is reported that negotiations are in progress looking to a consolidation of the United Gas Improvement Company and the North American Company. As is well known, the former operates gas works in more than thirty leading cities of the United States, and also controls the Connecticut Railway & Lighting Company, the street railway, gas and electric companies of Providence, R. I., and most of the gas and electric light companies in the territory adjacent to this city, except on Long Island. The North American Company controls electric railway, electric light and gas companies in and near Cincinnati, in Milwaukee and in St. Louis. This company has recently taken the electric light properties of Detroit, paying therefor about \$4,000,000.

NEW YORK, N. Y.—The New York News Bureau says that the agreement under which the \$2,300,000 bonds of the Nashville Railway Company have been sold to Isidor Newman & Sons, of New Orleans, and Ladenburg, Thalmann & Co., of New York, has been signed and delivered. "Nearly all of the bonds," says the News Bureau, "have already been deposited with the International Trust Company. The price to be paid is 80 cents on the dollar, and is to be made three instalments of \$15, \$30 and \$35 on each \$100 par of every bond on Nov. 3, Jan. 3, and March 3. No arrangement has yet been made with the stockholders, and it is not known how they will fare. It is believed that they will be treated liberally by the new purchasers of the bonds."

CLEVELAND, OHIO.—The Pomeroy-Mandelbaum syndicate is preparing to issue the securities of the Central Ohio Traction Company. This company is a consolidation of the old Central Ohio Traction Company, which the syndicate purchased some months ago, and the Mansfield, Crestlin & Gallion Railway, which has just been completed. As soon as possible the syndicate will build the link from Wellington to Mansfield by way of Ashland, and then it is probable that both properties will be consolidated with the Cleveland, Elyria & Western Railway.

ZANESVILLE, OHIO.—The Zanesville Railway, Light & Power Company, which has absorbed the local street railway and the lighting plant, has filed a mortgage for \$1,000,000, to secure an issue of 5 per cent bonds. Of these bonds \$780,000 will be issued at once, the remaining \$220,000 to be reserved for future improvements. Of the \$780,000 to be issued at once, \$250,000 will go to take up the outstanding 4 per cent bonds of the Zanesville Electric Railway Company. The new owners will make many improvements to both the railway and the lighting plant. The officers of the company are: F. A. Durban, of Zanesville, president; H. M. Bylesby, of Chicago, vice-president; W. D. Breed, of Cincinnati, treasurer; W. A. Gibbs, of Zanesville, secretary and manager.

SEATTLE, WASH.—The sale of the property of the Northern Railway Improvement Company, of New Whatcom, to Stone & Webster, of Boston, owners of the Seattle Electric Company, and Tacoma-Seattle Interurban Railway, was consummated a few days ago.



TABLE OF OPERATING STATISTICS

Notice.—These statistics will be carefully revised from month to month, upon information received from the companies direct, or from official sources. The table should be used in connection with our Financial Supplement "American Street Railway Investments," which contains the annual operating reports to the ends of the various financial years. Similar statistics in regard to roads not reporting are solicited by the editors. \* Including taxes. † Deficit. ‡ Comparison is made with 1900 because in 1901 the earnings were abnormal on account of the Pan-American Exposition. † All capital stock owned by Detroit United Ry.

COMPANY	Period	Total Gross Earnings	Operating Expenses	Net Earnings	Deductions From Income	Net Income Available for Dividends	COMPANY	Period	Total Gross Earnings	Operating Expenses	Net Earnings	Deductions From Income	Net Income Available for Dividends
<b>AKRON, O.</b>							<b>ELGIN, ILL.</b>						
Northern Ohio Tr. Co.	1 m., Sept. '02	67,492	35,907	31,495	12,907	18,588	Elgin, Aurora & Southern Tr.....	1 m., Sept. '02	37,806	20,273	17,533	8,333	9,200
	1 " " '01	59,242	31,396	27,846	12,031	15,815		1 " " '01	34,169	17,089	17,080	8,333	8,747
	6 " June '02	318,937	185,362	133,575	77,559	56,018		9 " " '02	308,241	179,124	129,117	75,000	54,117
	6 " " '01	298,967	164,458	104,510	63,494	41,016		9 " " '01	275,565	153,324	122,242	7,000	47,242
	12 " Dec. '01	617,011	*350,845	266,166	136,163	130,004	<b>FINDLAY, O.</b>						
	12 " " '00	513,725	*317,475	196,249	141,133	55,117	Toledo, Bowl'g Green & Southern Traction	1 m., Aug. '02	24,340	12,033	12,307	-----	-----
<b>ALBANY, N. Y.</b>								1 " " '01	16,849	9,025	7,824	-----	-----
United Traction Co.	1 m., Sept. '02	132,606	81,990	50,616	23,866	26,750		6 " June '02	111,372	60,838	51,134	-----	-----
	3 " " '02	414,635	251,739	162,897	71,598	91,299		6 " " '01	80,340	51,464	28,876	-----	-----
<b>BINGHAMTON, N. Y.</b>							<b>HAMILTON, O.</b>						
Binghamton St. Ry. Co.....	1 m., Sept. '02	18,432	10,460	7,972	-----	-----	The Cincinnati, Dayton & Toledo Trac. Co.	1 m., Sept. '02	44,090	23,050	21,040	16,251	4,788
	1 " " '01	18,456	9,986	8,470	-----	-----		4 " " '02	184,502	91,206	93,296	65,241	28,055
	3 " " '02	65,253	33,983	31,270	18,024	13,246	<b>LONDON, ONT.</b>						
	3 " " '01	63,160	31,024	32,136	14,988	17,148	London St. Ry. Co.....	1 m., S. pt. '02	18,157	8,648	9,509	2,110	7,399
<b>BOSTON, MASS.</b>								1 " " '01	15,034	7,854	7,179	1,873	5,306
Boston Elev. Ry. Co.	12 m., Sept. '01	10,869,496	7,336,597	3,532,899	2,896,359	636,539		9 " " '02	115,961	70,812	44,849	20,284	24,565
	12 " " '00	10,236,994	6,828,110	3,408,884	2,932,839	476,044		9 " " '01	106,709	65,919	40,790	17,843	22,947
<b>Massachusetts Elec. Cos</b>	12 m., Sept. '01	5,778,133	3,915,486	1,862,648	937,206	925,442	<b>MILWAUKEE, WIS.</b>						
	12 " " '00	5,518,837	3,659,337	1,859,500	994,294	865,206	Milwaukee El. Ry. & Lt. Co.....	1 m., Sept. '02	259,591	110,736	148,854	70,591	78,263
<b>BROOKLYN, N. Y.</b>								1 " " '01	210,632	93,587	117,045	63,998	53,047
Brooklyn R. T. Co.....	1 m., Sept. '02	1,124,384	607,581	516,802	-----	-----		9 " " '02	2,014,941	946,509	1,068,432	596,811	471,621
	1 " " '01	1,080,158	604,611	415,548	-----	-----		9 " " '01	1,785,247	878,339	906,908	561,402	345,507
	3 " " '02	3,587,739	1,881,774	1,705,905	-----	-----		12 " Dec. '01	2,442,342	1,185,534	1,256,808	755,139	501,669
	3 " " '01	3,411,101	2,032,245	1,378,855	-----	-----		12 " " '00	2,226,698	1,129,787	1,090,911	824,665	266,247
	12 " June '02	12,789,705	*895,214	3,837,490	-----	-----	<b>MINNEAPOLIS, MINN.</b>						
	12 " " '01	12,101,198	*797,063	4,130,503	-----	-----	Twin City R. T. Co.....	1 m., S. t. '02	339,669	130,611	209,059	60,233	148,825
<b>BUFFALO, N. Y.</b>								1 " " '01	308,394	123,131	185,263	57,875	127,386
International Tr. Co.	1 m., Sept. '02	321,355	161,525	159,831	77,502	82,329		9 " " '02	2,667,095	1,191,320	1,475,775	530,733	945,042
	1 " " '01	255,322	108,934	146,388	81,931	64,457		9 " " '01	2,340,165	1,068,846	1,271,318	563,273	708,044
	3 " " '02	1,019,518	506,664	512,854	235,741	277,113	<b>MONTREAL, CAN.</b>						
	3 " " '01	791,470	344,745	446,725	245,793	250,932	Montreal St. Ry. Co.	12 m., Sept. '02	2,046,209	1,135,176	911,032	-----	-----
<b>CHARLESTON, S. C.</b>								12 " " '01	1,900,680	1,105,267	795,413	-----	-----
Charleston Consol'd Ry. Gas & El. Co.....	1 m., Aug. '02	45,217	31,191	14,026	13,357	669	<b>NEW YORK CITY.</b>						
	1 " " '01	45,474	28,296	17,178	13,627	3,481	Manhattan Ry. Co.....	12 m., June '02	11,291,711	5,518,585	5,773,126	2,699,670	3,073,456
	6 " " '02	358,984	203,200	155,784	81,064	74,720		12 " " '01	10,253,271	5,253,229	5,000,042	2,677,706	2,322,336
	6 " " '01	246,438	163,145	83,293	82,618	674	<b>Metropolitan St. Ry.</b>	3 m., Dec. '01	3,887,936	1,723,972	2,143,964	1,151,140	992,824
<b>CHICAGO, ILL.</b>								3 " " '00	3,786,030	1,699,649	2,086,381	1,138,467	947,914
Chicago & Milwaukee Elec. Ry. Co.....	1 m., Sept. '02	19,347	6,988	12,359	-----	-----		12 " June '02	15,866,641	7,385,883	8,480,758	4,815,421	3,665,337
	1 " " '01	19,197	6,548	12,649	-----	-----		12 " " '01	14,720,767	6,755,131	7,965,636	4,534,068	3,481,567
	9 " " '02	147,407	59,847	87,560	-----	-----	<b>OLEAN, N. Y.</b>						
	9 " " '01	132,159	56,118	76,041	-----	-----	Olean St. Ry. Co.....	1 m., July '02	6,569	3,216	3,353	1,771	1,502
<b>CLEVELAND, O.</b>								1 " " '01	5,954	2,307	3,747	1,768	1,979
Eastern Ohio Traction Co.....	1 m., Sept. '02	21,375	10,808	10,567	6,033	4,533		12 m., June '02	56,055	29,118	26,937	16,318	10,619
	1 " " '01	17,761	8,413	9,348	5,122	4,226		12 " " '01	52,018	26,228	25,790	16,755	9,035
<b>Cleveland, Elyria &amp; Western</b>	1 m., Sept. '02	30,464	14,999	15,464	-----	-----	<b>PEEKSKILL, N. Y.</b>						
	1 " " '01	27,430	12,347	15,083	-----	-----	Peeckskill Lighting & R. R. Co	3 m., Sept. '02	9,480	5,211	4,269	2,083	2,186
	9 " " '02	219,968	122,051	97,919	-----	-----		3 " " '02	28,674	15,881	12,793	6,256	6,543
	9 " " '01	185,992	100,787	85,206	-----	-----		12 " June '02	86,795	*56,392	30,402	23,125	7,277
	12 " Dec. '01	249,260	136,865	112,394	57,023	55,371	<b>PHILADELPHIA, PA.</b>						
	12 " " '00	179,698	102,393	77,304	34,562	42,742	Union Traction Co.....	12 m., June '02	14,118,159	6,402,338	7,715,820	*6637781	1,078,038
<b>Cleveland, Painesville &amp; Eastern</b>	1 m., Sept. '02	18,499	10,035	8,464	-----	-----		12 " " '01	13,431,681	5,836,186	7,595,494	*6734323	861,266
	1 " " '01	18,822	9,649	9,174	-----	-----	<b>American Railways</b>	1 m., Sept. '02	125,159	-----	-----	-----	-----
	9 " " '02	144,464	76,966	67,499	-----	-----		1 " " '01	91,152	-----	-----	-----	-----
	9 " " '01	124,184	63,243	60,941	-----	-----		3 " " '02	245,455	-----	-----	-----	-----
	12 " Dec. '01	164,971	*87,102	77,869	72,500	5,369		3 " " '01	180,811	-----	-----	-----	-----
	12 " " '00	141,112	*89,592	71,520	72,500	†980		12 " June '02	1,009,509	-----	-----	-----	-----
								12 " " '01	844,298	-----	-----	-----	-----
<b>COVINGTON, KY.</b>							<b>ROCHESTER, N. Y.</b>						
Cincinnati, Newport & Covington Ry. Co.	1 m., Aug. '02	96,118	*53,295	42,823	22,238	20,585	Rochester Ry.....	1 m., Sept. '02	93,762	46,063	47,699	24,833	22,866
	1 " " '01	74,525	*45,741	28,784	15,807	12,977		1 " " '01	82,428	45,854	36,573	24,942	11,632
	8 " " '02	596,156	*344,026	252,130	131,230	130,899		9 " " '02	821,852	433,691	388,161	223,361	164,800
	8 " " '01	535,784	*327,615	208,169	125,328	82,841		9 " " '01	758,110	449,253	308,858	222,018	86,840
<b>DETROIT, MICH.</b>							<b>SYRACUSE, N. Y.</b>						
Detroit United Ry....	1 m., Sept. '02	323,618	176,993	146,625	-----	-----	Syracuse R. T. Co....	1 m., Sept. '02	61,164	33,545	27,619	19,025	8,594
	1 " " '01	282,351	153,288	129,013	-----	-----		1 " " '01	53,992	29,692	24,300	19,025	5,275
	9 " " '02	2,578,696	1,449,499	1,129,197	-----	-----		3 " " '02	184,314	101,224	83,090	57,075	26,015
	9 " " '01	2,245,842	1,228,862	1,016,980	-----	-----		5 " " '01	168,368	91,526	76,842	57,021	19,821
	12 " Dec. '01	2,919,171	*1596765	1,322,046	652,277	670,129	<b>TOLEDO, O.</b>						
	12 " " '00	2,575,277	*1499058	1,136,219	616,468	519,751	Toledo Ry. & Lt. Co.	1 m., Sept. '02	127,640	62,001	65,638	38,921	26,717
<b>DETROIT and Port Huron Shore Line</b>	1 m., Sept. '02	39,771	23,491	16,281	-----	-----		1 " " '01	114,667	50,512	64,156	37,813	26,343
	1 " " '01	35,687	21,576	14,111	-----	-----		9 " " '02	1,069,059	546,588	522,470	342,709	179,762
	9 " " '02	323,130	188,809	134,321	-----	-----		9 " " '01	959,099	460,885	498,214	301,730	196,484
	9 " " '01	295,917	169,855	126,061	-----	-----		12 " Dec. '01	1,311,084	*636,407	674,677	415,168	259,509
								12 " " '00	1,182,517	*616,945	565,572	409,051	156,521
<b>DULUTH, MINN.</b>							<b>Lake Shore Elec. Ry. Co.</b>	1 m., July '02	49,122	25,961	23,161	-----	-----
Duluth-Superior Tr...	1 m., Sept. '02	46,763	23,091	23,672	9,619	14,053		1 " " '01	39,447	21,837	17,610	-----	-----
	1 " " '01	39,											