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EDITORIAL NOTICE

Street railway news, and all information regarding changes of officers, new equipments, extensions, financial changes and new enterprises will be greatly appreciated for use in these columns.

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Boston Elevated Litigation

The decision of Chief Justice Mason, of the Supreme Court, in the case of E. F. Baker against the Boston Elevated Railway Company for damages arising from the noise caused by the operation of that road, is not final, as the Supreme Court of the State will be called upon to review it, but it is, nevertheless, a very interesting document. Heretofore the noise caused by a railway has not been considered a fair ground for assessing damages; the improvement in the facilities for transportation afforded by the establishment of such lines being considered sufficient to offset the annoyance arising from the increase in noise. In the case of electric street railways, it has been pointed out, the cars do not occasion loss of light and air, as they do not obstruct the streets more than other vehicles. They do, however, occasion a certain amount of noise, yet it has not been considered that this constituted sufficient ground for an action for damages on the part of abutting property owners. The contention is made that the noise created by the trains of the elevated railway is very much louder than that caused by the surface cars, but, on the other hand, it is doubtful if this increase is sufficient to warrant such a radical departure from former rulings. Another difficulty in assessing such damages is met in determining the loss to a plot of real estate caused by the noise made by the trains of a railway system running in close vicinity to it. It is doubtful, moreover, whether any general rule can be laid down that could fairly apply. Where the "L" trains, for instance, run between blocks of high buildings the noise by reverberation is much more intense than if the sides of the street were open land or only covered by low buildings. In the case in question the Superior Court found that the petitioner's estate had been damaged more than it had been benefited by the construction and operation of the elevated road, "not including any damage resulting from the impairment of the facilities of public travel, or any annoyance or discomfort to any in the use of such facilities," to the extent of \$2,000, and that one-half the damage was caused by noise, and that the damage caused by noise was \$100 more than it would have been if the road had been constructed in that part of the street the fee of which was not owned by the petitioner.

It is admitted on all sides that the company is endeavoring to discover and apply some means of reducing the noise which now accompanies the running of its trains, and that this noise is entirely due to the character of the service given, but that at the present time it cannot be obviated without greatly crippling the business of the city. These facts will undoubtedly be impressed upon the Supreme Court when the case comes up for review, and it is hoped that that tribunal will appreciate the necessity of relieving the corporation of any unnecessary burdens in the form of damages.

The Right to Labor

The legal proceedings instituted last week against the Pawtucket Street Railway Company comprise one of several actions intended to test the validity of the ten-hour law passed by the last General Assembly of the Rhode Island Legislature for the benefit of motor-men and conductors. The companies affected declare that the law is unconstitutional, but the labor unions which secured its passage insist upon its strict observance. It was this conflict of opinion that led to the recent strike on the Providence and Pawtucket lines. That movement was a complete failure, and resulted most disastrously for the union, as the men suffered great loss in wages, and forfeited the respect and sympathy of the community by their violence, destruction of property and outrages. They were finally glad to go back to their positions under the old terms. The company had expressed a willingness to submit the questions in dispute to the proper tribunal for judicial settlement before the strike was declared, and, although the men rejected the offer, the company upon the settlement of the strike at once took steps to secure a judicial interpretation of every phase of the ten-hour law.

Aside from the purely local features of the case the present

controversy is interesting, as it involves such questions as the right of private contract, union dictation in the matter of regulating hours of labor and the principle of labor organizations preventing individual workmen from securing employment in place of strikers. Why should not an employer and workman enjoy the right to enter into a contract governing the terms of employment, whether it provides for ten hours a day or some other period? Why should an organization be allowed to dictate to individual workmen when and where and how they shall be employed and what compensation they shall receive? Why should any man be deprived of his right to labor because he is not a member of a union or because the union will not permit its members to work? These are vital questions, and they are constantly confronting street railway managers and other employers of labor, though not less vitally than they do the man who seeks an honest livelihood, and whose only commodity is the labor which he can perform.

The attitude of the companies generally in the matter of compensation is that the scale of wages in the several departments must be based upon the earnings of the system, and the proportionate value of the services contributed. This is a fundamental principle in every large industrial organization, and there is nothing in the make up of street railway properties that justifies the violation of this rule. Legislation will not change conditions in the commercial and financial world, and every attempt to enact and enforce oppressive measures of the kind under considerations, or regulations at variance with sound business judgment, is bound to react upon those who originate them.

The right to labor and to sell one's services to the best advantage is denied to the individual workman when it conflicts with union regulations. The man who has the capacity and inclination to do more and better work than his associates is restricted by the rules of the union. He must not work more than a certain number of hours, he must not perform more than a limited service every day. It matters not if the requirements of his family or his personal ambition prompt him to excel his fellow workmen, or that he may have the ability and desire to win honorable promotion by faithful service. The gifts with which he has been endowed must lie dormant and his responsibilities and domestic needs must be disregarded in compliance with the precept of the union. The Higher Law must be modified to conform with the union rules.

It is not strange under the circumstances that employers at times become exasperated because of the unreasonable demands of the union and find it necessary, in self-defence, to oppose the organization. The attitude of the labor leaders has not been conducive to better understanding, and often, as in the present case, they have been encouraged by the support of political demagogues who pass such measures as that complained of in Rhode Island, and then not only excuse, but even assist such lawless demonstrations as those which marked the Pawtucket strike. The right to labor is inalienable, and any organization that seeks to prevent an individual from exercising that right is proceeding upon a radically wrong principle.

### Freight Terminal Stations

Three or four years ago it was a question whether the haulage, of light freight and express matter on electric railways paid. There is no doubt on the subject now; that question has been settled by the large amount of this business which has been obtained and is being successfully carried on by the electric interurban railways, large and small, which have been completed during the past seven or eight years. A few States still have statutes against the transportation of freight by electric railways, on the theory that the highways are not intended for freight cars and that, consequently, they should not be allowed there. This, however, is a specious argument, for three-quarters of the vehicles which traverse these roads are for the transportation of merchandise, and if this merchandise can be carried more cheaply and quickly within an electric car than on a cart or dray, the shipper, as well as the public, is benefited.

As the electric freight business has been conducted to a greater extent on the extensive interurban railways of the middle West than in any other part of the country, it is natural to look for the latest developments in this direction to that section of the country. It is not surprising, therefore, to find that, in some of the larger cities in this center of interurban traffic, it has been found advisable to build regular freight terminal stations to be used only by electric railway freight cars. One of the latest, as well as one of the largest stations of this kind, is that owned by the Interurban Terminal Company in Cincinnati, and which is fully described and illustrated in this issue. This station, which is used by three interurban lines centering in Cincinnati—the Rapid Railway, the Suburban Traction Company and the Cincinnati & Eastern Electric Railway Company—is designed to accommodate passengers as well as to handle incoming and outgoing freight. The detailed arrangement of the floors, of which there will be six, and the arrangement of tracks within the building are fully described elsewhere in this issue, and need not be referred to again here, except to call attention to the building, and comment on it as an interesting indication of the rapid development of the suburban electric freight service.

\* \* \*

The great difference which has always existed between the passenger transportation business by steam and by electric power, and the principal advantage possessed by electricity for this service, has been in the possible economic subdivision of power by making the car the unit, instead of the train. Electricity would not now be used as extensively as it is for passenger transportation if it had not been for the fact that single electric cars can be operated almost as cheaply as long trains, and consequently that a short headway could be adopted with small units where, with the steam trains, the traffic to secure economy has to be divided between comparatively fewer and larger units. The general public and investors, however, may not realize that the same principles apply in the transportation of freight except, possibly, between large cities. In fact, the possibilities of economy through a frequent electric freight transportation service between small communities, as compared with the old steam train idea, are so great that they will and are, where the system is in force, almost revolutionizing methods of conducting business. To understand clearly just how this is brought about, we will refer briefly to the present system of steam freight transportation.

On steam railroads, the margin between profit and loss is so small that the freight train schedule must be made up so as to make as many cars compose a train as possible; and to still further reduce expenses, the tendency is constantly growing to build larger and heavier locomotives, so that more freight cars can be hauled in each train. The result is that freight received at any distributing center, like a large city, is held at that point until a sufficient quantity has collected to justify the running of a long train. For a small town, where the aggregate amount of freight received or shipped is not considerable, enough cars on the average may not be received at or for the distributing point to justify a schedule of a train oftener to serve that point than once a day or once in two days, or possibly at longer intervals. The result of this is twofold; in the first place, the merchant has to have his goods shipped a long time ahead, so that they will be received at the time wanted, and either he or the shipper, which means ultimately that the public, has to pay the interest on those goods while in transit. In the second place, the consignee is obliged to carry a large stock on which he also has to pay interest and insurance, and to keep a good-sized corps of warehouse clerks, as his goods are received by him at rare intervals and in large quantities.

Assume, however, that his goods can be shipped immediately on receipt of his order, even if they amount to only a half of a car load or even less, and can be delivered promptly. Even if he has to pay a higher rate per ton mile he will not only avoid the loss in interest and the warehouse expenses mentioned above, but he

can often also transfer the goods directly to the shelves of his shop without storing them, and will thus save one extra handling. In other words, the local merchant would be a distributor only and not a warehouse keeper.

This is, theoretically as well as practically, one important saving being made through a frequent freight train service by means of small units, a saving which, ultimately, as in the case of all economies of this kind, goes to the public. On some of the Ohio lines, for example, it is not an uncommon practice for the local dealers in fresh provisions in a small town to telephone their orders to the large markets, which may be fifteen or twenty miles away, the same day in which the goods are delivered and sold. Thus, if the orders are transmitted early in the morning, the goods are placed on the electric freight car within an hour, and will be in the local market in time for the day's deliveries.

In this discussion we have not attempted to refer to the corresponding economies possible by a frequent freight transportation service from the small towns to the large one, but it is apparent that the same arguments will apply in this case as in the one just cited. In other words, the electric freight service possesses intrinsic advantages without encroaching in any way upon the through freight business of the steam railroad companies, and these advantages are so considerable that freight haulage on electric railways must, ultimately, form a very large percentage of the total business done. This phase of the economy of electric railway freight operation has been touched upon briefly in these columns before, but the principle of frequent train service is so important, whether it be for passengers or freight, that it should not be lost sight of. The electric railway freight business of this country is yet comparatively small, but its possibilities are enormous, and far-sighted managers are making arrangements to take care of it when it comes, if they have not already instituted a service of this kind.

### Special Conditions in Franchises

We had occasion last week to publish an editorial on the subject of "Special Conditions in Franchises," and recited an incident which occurred in New York State within the last month, where a railroad company absolutely declined to insert any special conditions in its franchise in a certain city and stood upon its statutory rights in the premises. The subject is one which intimately concerns the prosperity of railway companies, yet is so broad and has so many phases that everything pertinent to the subject could not be said in one editorial or even in a dozen. Nevertheless cases are constantly occurring where railway companies are seriously hampered in one direction and in another by clauses of this character which have been insisted upon by the local authorities, and as a result of which they are prevented from giving the best possible service to the public.

Experience has shown that when a railway company has once accepted a condition to a franchise every obstacle is put in the way of efforts made for its removal, whether such a change would be for the benefit of all or not. For this reason, the question is one which should be settled, if possible, fairly and squarely by the railroad company before it has committed itself to the franchise by the construction of track in a city or the investment, in any other way, of capital which cannot easily be recouped. We do not propose, in these remarks, to exhaust the subject of the franchise question, but there is, perhaps, one point in connection with the incident related last week, to which we did not have space to refer with especial emphasis in our last issue, but whose application might be of benefit in some cases.

It is fair to say that no railway line or, in fact, no public improvement was ever suggested in any city which did not encounter some objectors. The obstructionists to a railway line, or in fact to any proposed public improvement, will be found to consist of four classes: First, those who raise objections as a matter of business, in other words, the blackmailers, either political or otherwise, who wish to be bought off; second, the politicians,

who adopt an obstructive policy entirely from political motives, independent of whether the project will be an improvement to the city or not, in other words, the demagogues, who hope to secure a certain amount of notoriety and popularity, as well as reputation for far-sightedness by opposing a plan which certain other people advance. The third class in this classification consists of the cranks, who, while acting from conscientious motives, cannot fail to see jobbery and corruption in every corporate undertaking. They are pessimists, who, in their social relations or family life may be highly estimable, but when it comes to matters of public concern, are an unmitigated nuisance, especially when their action is followed as an example by others who should be better informed. The fourth class consists of other citizens, who, also acting from conscientious motives, do not believe that the proposed road or other project is of benefit to the city, but their opinion can be changed by argument and proof, if the merits of the project are such as to warrant it.

Of these four classes of objectionists the first will constitute only a very small minority and can easily be outvoted, while the second will change front like a weathercock with a change in public sentiment. The third class will be found the most unreasonable of all, and make more noise and opposition in proportion to their numbers than all of the other three classes combined. Practically no amount of argument and proof of the benefits of any proposed undertaking will suffice to change their opinion. They are naturally obstructionists and will insist that no proposed change is for the better. The only hope of overcoming opposition then is to appeal to the fourth class of citizens and show them clearly, provided the property has merit, that it will be of benefit to the community at large, and thus bring around the public sentiment in its favor.

In the case mentioned last week this was done by a public meeting. It is not always advisable to call such a meeting unless the merits of a company's position have been pretty thoroughly discussed previously in the local papers and elsewhere, so that people will not attend in a prejudiced state of mind. When, however, the subject has been thoroughly debated for some time and enough interest exists to insure a representative expression of opinion, a public meeting, in a small town, offers the best opportunity for refuting specious arguments against the undertaking, stiffening the backbones of those in favor of it, and winning over those whose minds are open to argument but who are undecided as to the proper course. The American public has a very large bump of common sense, and, when a question is thoroughly understood, has very little patience with cranks who object to a proposition simply for the sake of doing so. An officer of the company who can state the position of his corporation clearly and precisely, and who can show why such a proposition can be allowed and why such an one cannot, and who, above all, has merit and common sense on his side, can nearly always bring over to his way of thinking such a large percentage of his audience that the few remaining objectors, for one reason or another, will be overruled.

### Standing in Open Cars.

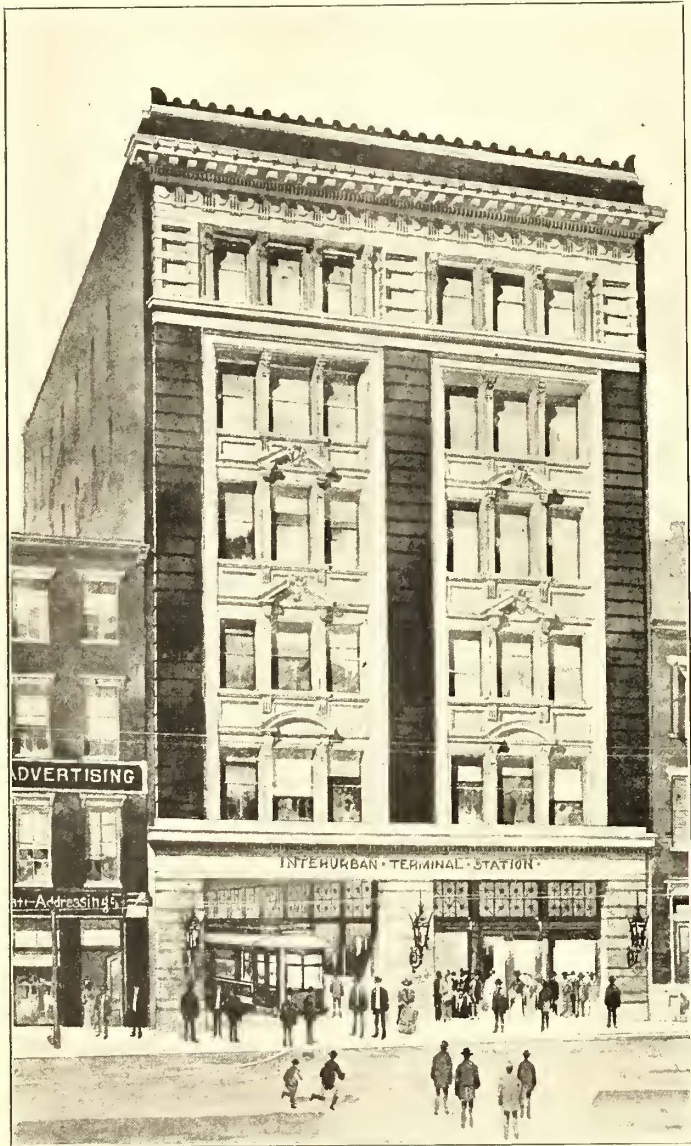
For New York and such other cities as have in contemplation the passage of an ordinance to prohibit passengers standing between the seats of an open car there is a lesson in a court decision handed down recently at Fall River. It would seem that residents of that city with ideas as to how a street railway ought to be run succeeded in having passed an ordinance to the effect that passengers could not stand between the car seats. Some one who could not get a seat instituted legal proceedings against the local company, and the judge before whom the case was heard ruled that any such ordinance was unconstitutional. We believe that if there was an effort to enforce such a law, unless passengers were allowed to stand on the running board, there would be just as much, if not a great deal more, complaint from people who could not get on a car, than there is now.

Large Interurban Terminal Station in Cincinnati

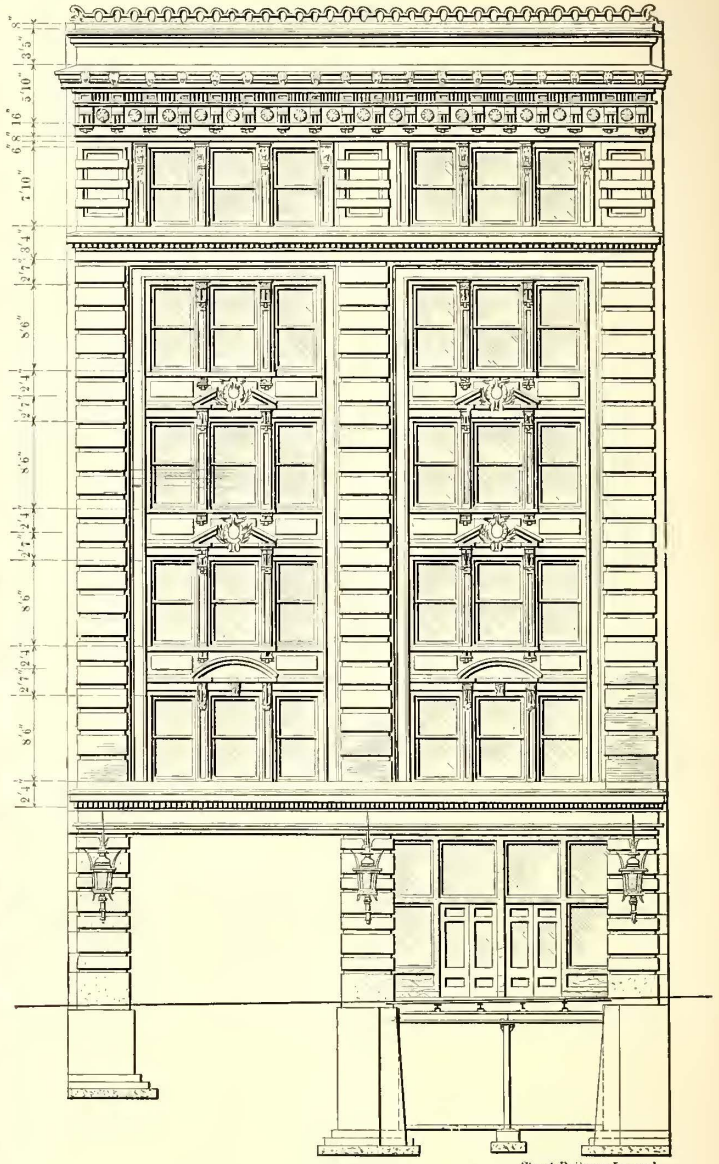
The extent of the interurban electric railway business centering in Cincinnati has led to the establishment in that city of a large terminal station, which will be used by the Rapid Railway, the Suburban Traction Company and the Cincinnati & Eastern Electric Railway Company. The building is being erected by the Interurban Terminal Company, of which G. R. Scrugham is president and general manager, and is being built on Sycamore Street, between Fourth and Fifth Streets. This is within one block of the govern-

established methods of express companies, having all packages charged and bills made out for everything placed on the cars. The company will also establish express and freight depots at every village along the lines of the interurban railways operating from this depot, and will place an agent in charge.

It is the plan of the company to operate hourly upon each of the three roads mentioned combination cars, which will handle light packages and mail, and at night to operate regular freight cars. These cars will be equipped with four motors each, and will measure 40 ft. inside. They will be able to handle heavy freight, such as dry goods and groceries, but it is not the immediate inten-



TERMINAL STATION OF INTERURBAN ROADS AT CINCINNATI



ELEVATION OF INTERURBAN TERMINAL STATION

ment building in Cincinnati, and is practically at the center of the city. Through the courtesy of Mr. Scrugham this paper is able to present plans and front elevations of the building, which will be completed by Oct. 1.

As will be seen from the elevations, the building possesses six floors. The ground floor is devoted partly to a double track, through which the interurban cars run, and partly to waiting rooms. In the rear of the building is a large freight shed. The waiting rooms comprise one large general room with ticket office and checking room, news stand, etc., a ladies' waiting room, toilets, etc., and passenger elevator. The freight shed, which is in the rear of the building, is connected with the upper floors by a freight elevator. At present the company will deliver freight coming in on the cars using the station through a local delivery company, and the freight shipped out of the station will be delivered at the freight depots by the consignor. The company proposes, however, next year to start a system of express delivery wagons, not only for delivering the freight and express matter coming in on the roads, but also to collect freight and express from different points in the city to be shipped to points along the interurban lines. The system of handling this freight will be very similar to the well-

tion of the company to haul bulk freight, such as grain, coal or lumber.

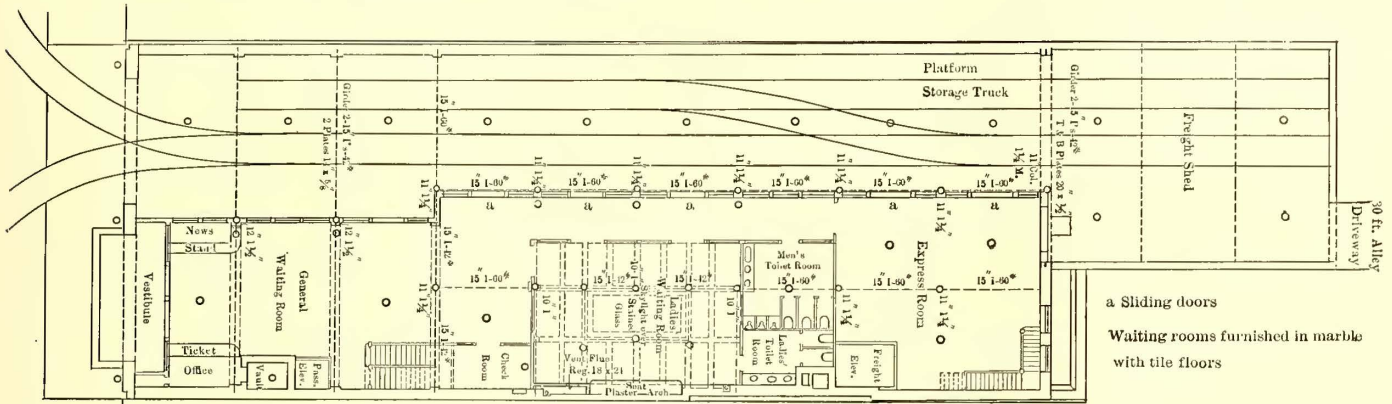
A great part of the territory just outside of Cincinnati is extremely fertile and is devoted largely to market gardening. At present most of this produce is hauled to the markets by wagon. The proposed system for electric freight hauling, however, will allow the shipment of this produce by the electric freight cars, and as the terminal station is within a radius of three blocks of five of the largest produce markets in Cincinnati, a large business, it is expected, will be secured. By this system it is expected that vegetables can be delivered at the markets in much better shape than they possibly can be delivered by wagons, and at a very much lower cost than the system now employed. In addition, the city will be rid of a great deal of carting, which wears out the pavements, produces unnecessary noise and blocks the streets.

One of the engravings shows the plan of the second floor in the terminal station, and the floors above this are to be finished in the same manner. As will be seen, rooms for offices are provided in the front part of the building, while the rear of the floors gives large storing capacity, amply sufficient to enable the company to keep separate the freight and express matter for the different roads.

It should be stated in this connection that the building, as indicated in the illustration, is being erected in the most substantial manner. The waiting rooms are finished as fine as any hotel corridor, with separate waiting rooms for ladies and with all necessary conveniences. The building itself will cost about \$130,000, which may seem to some a very large sum for a depot devoted to interurban electric railway service. Mr. Scrugham, however, considers that this is the right policy to pursue. He believes that with a station of this kind the general public will become accustomed to using the inter-

**The Detroit Convention**

A circular letter has just been issued by T. C. Penington, secretary of the American Street Railway Association, giving some additional information in regard to the Detroit Convention. The letter states that the meetings will be held at the Light Guard Armory in Detroit. Sessions of the association will be held on Wednesday, Oct. 8, and Friday, Oct. 10. Thursday, Oct. 9, has been set apart as Exhibitors' Day. No session of the as-

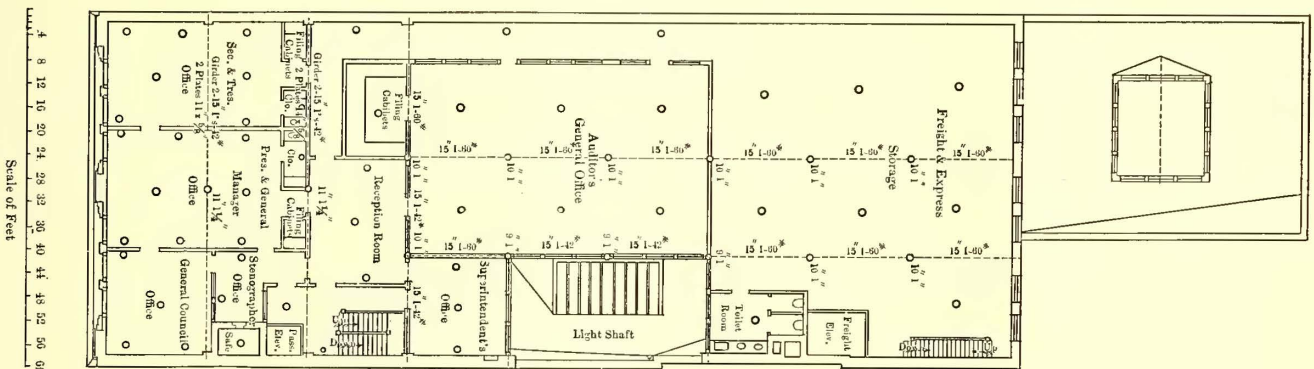


PLAN OF GROUND FLOOR

urban depots as they would a central union depot of steam railroads, and by locating these stations in the very center of the business district, electric roads will be in a far better position to compete for the commuter travel than if they used belt lines or loops and had the general public wait on street corners for cars.

sociation will be held, so all may have time to examine the exhibits.

The headquarters of the association will be at the Cadillac Hotel. Other first-class hotels are: Russell, Wayne, St. Clair, Normandy, Griswold and Metropole. The annual dinner will be



ARRANGEMENT OF OFFICES ON SECOND FLOOR

So far as the freight business is concerned there seems to be no question but that far better results can be secured, certainly where the business is a large one, by having a depot for loading and unloading cars near the center of the city, where the business can be carried on on a large and consequently economical scale.

The architects for this building are the well-known firm of Werner & Adkins, and L. P. Hazen & Co. are the general contractors.

**Profit Sharing for Employees of a Canadian Company**

The British Columbia Electric Railway Company, Ltd., operating the street railway lines in New Westminster, Vancouver and Victoria, B. C., and a 12-mile interurban line connecting Vancouver and New Westminster, has announced that its employees are to share in the profits of the company when the latter exceed the amount necessary to pay a 4 per cent dividend on the stock. The amount of profits available for distribution after the regular 4 per cent dividend is paid to the stockholders will be divided into three parts, two of which are to go to the stockholders of the company, while the remaining third will be divided among the employees. With the announcement of the profit-sharing plan the company also announced a general increase in wages. The old rate for conductors and motormen was 20 cents per hour for the first year of service, 21 cents for the second and third years, and 22 cents thereafter. The company will now pay 20 cents for the first year, 22 cents for the second, 23 cents for the third, and 25 cents thereafter. The only other company, so far as can be recalled, with a similar system of profit sharing is the Columbus Railway, of Columbus, Ohio.

held at the Cadillac Hotel on Friday evening, Oct. 10, when the officers-elect will be installed.

The following resolution has also been unanimously adopted by the executive committee: "The secretary is directed to request the chief executive officer of the different companies to notify all delegates and heads of departments attending the convention that they are expected to be present at all sessions of the meeting and take part in the discussions."

Special arrangements have been made for the entertainment of ladies, and the Detroit committee promises all who attend a very enjoyable time.

The passenger associations have granted excursion fares from all points (except in Michigan from points on the Michigan Central Railroad and Lake Shore & Michigan Southern Railroad, from which the rate of fare is 2 cents per mile).

To secure this rate persons attending the convention must purchase regular tickets to Detroit and get, at the time of purchasing their tickets, properly executed certificates from the ticket agent.

Tickets for the return journey will be sold by the ticket agent at Detroit for one-third the first-class limited fare to those holding certificates signed by the ticket agent at the point where ticket is purchased, countersigned by the secretary of the association and signed and stamped by a special agent of the Michigan Passenger Association.

Tickets for return journey must be purchased within three days after the adjournment of meeting, Sunday not being reckoned as one of the three days.

No certificates will be honored if issued in connection with any ticket unless full fare shall have been paid to Detroit, and certificates are not transferable. The secretary states that no refund of fare can be expected if the delegate does not get a certificate when

his original ticket is purchased. All certificates thus secured are to be left with the clerk at the exhibit hall when the member registers.

John H. Fry, chairman of the exhibit committee, has also made the following announcements concerning the rules and regulations governing the exhibits:

The exhibition will open Oct. 8, 1902. The building will be open for the reception of exhibits commencing Monday, Oct. 6. All articles intended for exhibition shall be delivered at the Light Guard Armory by the agent or owner and at his expense; but the local committee has made arrangements with the Riverside Storage & Cartage Company to haul and deliver all shipments to and from the building, if desired, at low rates. Mark goods to yourselves, care of Riverside Storage & Cartage Company, Detroit, Mich., send this company bill of lading, or advice of shipment, and prepay charges. Under no circumstances will exhibits be received on which there are charges of any kind.

Ship all goods early to insure delivery in time. All apparatus or material for exhibits should be shipped so as to arrive in Detroit not later than Saturday, Oct. 4.

### Electric Interurban Railways in Indiana

The projecting and building of electric interurban railways in the State of Indiana has taken place so rapidly that it is difficult to keep accurate record of the progress of all the projects, but the accompanying map shows the roads built and actually under construction, as far as can be ascertained.

A level, thickly-settled country, with good-sized towns at frequent intervals, are the factors that have made the central part of Indiana one of the important interurban districts of the United States. Indianapolis is now a great interurban electric railway center, as it has in the past been for a number of years a great steam railroad center.

The most extensive of the Indiana interurban systems is that of the Union Traction Company, of Indiana (No. 1), which already has 100 miles of interurban line in operation. This road is one of the leaders among the electric interurbans in the country, not only in size but in advanced practice and high speeds. Many of its excellent peculiar features have been described in these columns the past year. With the completion of the new lines acquired by the lease of the projected Indianapolis & Northern Railway, the company will almost double the mileage of the system. All these lines parallel steam roads, and are on private right of way, equipped and graded to make high speeds of over 50 miles per hour. The following is a list of towns served by the Union Traction Company of Indiana, and also those which will be reached by the new lines, together with the population of each in 1900:

Population		Population	
Indianapolis	169,164	Gas City	3,622
Lawrence	385	Elwood	12,950
Oaklandon	300	Hobbs	222
McCordsville	301	Tipton	3,764
Fortville	1,006	Atlanta	1,900
Ingalls	542	Arcadia	1,413
Pendleton	1,512	Cicero	1,603
Anderson	20,178	Noblesville	4,792
Chesterfield	164	Nora	70
Daleville	500	Broad Ripp'e	487
West Muncie	200	Jackson	72
Muncie	20,942	Sharpsville	500
Linwood	100	Kokomo	10,609
Alexandria	7,221	Bunkerhill	568
Summitville	1,432	Peru	8,463
Fairmount	3,205	Lincoln	107
Jonesboro	1,838	Walton	498
Marion	17,337	Logansport	16,204

The Indiana Railway Company (No. 2) is the most extensive system in the northern part of the State, and joins a prosperous belt of towns. It has been in operation a number of years, and connects the following:

Population		Population	
Goshen	7,810	Mishawaka	5,560
Elkhart	15,184	South Bend	35,999

From South Bend an extension is being built to Niles, Mich., and thence to St. Joseph and Benton Harbor on Lake Michigan.

The Fort Wayne & Southwestern Traction Company (No. 3) is a new road, of which W. B. McKinley, of Champaign, Ill., is president, and is built from Fort Wayne to Wabash. The towns through which it runs are:

Population		Population	
Fort Wayne	45,115	Andrews	746
Aboite	40	Lagro	456
Roanoke	536	Wabash	8,618
Huntington	9,491		

The Muncie, Hartford & Fort Wayne Electric Railway Company (No. 4) is under construction from Muncie to Montpelier, through Hartford City. Cleveland and Muncie men are officers of the road, and E. P. Roberts & Company, of Cleveland, are engineers of the construction. The towns and population served by the Muncie, Hartford & Fort Wayne Electric Railway are:

Population		Population	
Muncie	20,942	Hartford City	5,912
Royerton	250	Mollis	18
Eaton	1,567	Montpelier	3,405

The Indianapolis, Greenwood & Franklin Railroad Company (No. 5), running south from Indianapolis, has operated some time between Indianapolis and Franklin, and will soon operate as far as Columbus. Its towns and their populations are as follows:

Population		Population	
Indianapolis	169,164	Amity	94
Southport	285	Edinburg	1,820
Greenwood	1,503	Taylorville	450
Whiteland	334	Columbus	8,130
Franklin	4,005		

The Terre Haute Electric Company (No. 6) has an interurban line from Terre Haute to Brazil and Knightsville, the latter being coal mining centers and the former the largest town in that part of the State. The territory served by the road is:

Population		Population	
Terre Haute	36,673	Brazil	7,786
Glenn	76	Knightsville	1,171
Seelyville	129	Harmony	1,020
Cloverland	155		

The Indianapolis & Eastern Electric Railway, formerly the Indianapolis & Greenfield Rapid Transit Company (No. 7), is another interurban that has been operating out of Indianapolis for some time. Its towns are as follows:

Population		Population	
Indianapolis	169,164	Philadelphia	182
Irrington	1,799	Greenfield	4,489

This road extends almost due east from Indianapolis, and in the course of time it will be possible to ride on electric cars as far as Richmond, almost to the eastern boundary of the State. It is also likely that the western boundary of the State, at Terre Haute, can be similarly reached.

The Indianapolis & Martinsville Rapid Transit Company (No. 8) is operating part of its line. This is a company of which Charles Finley Smith, an Indianapolis banker, is president. The towns it will serve are:

Population		Population	
Indianapolis	169,164	Martinsville	4,038
Mooreville	974		

The Indianapolis, Shelbyville & Southeastern Railway (No. 9) is a property recently completed by Townsend, Reed & Co., of Indianapolis, reaching the following towns:

Population		Population	
Indianapolis	169,164	Brookfield	300
Bethel	141	Fairland	513
Acton	460	Shelbyville	7,169

The Indianapolis, Lebanon & Franfort Railway (No. 10), now being built and financed by Townsend, Reed & Co., of Indianapolis, is second in extent only to the system of the Union Traction Company of Indiana. Like the Union Traction it is being built for high speed and will employ polyphase current distribution. The road is being built from Indianapolis northwest to Lebanon, where it branches, one line going to Crawfordsville and the other to Frankfort and Lafayette. It will give service between the following towns:

Population		Population	
Indianapolis	169,164	Crawfordsville	6,649
Zionville	765	Frankfort	7,100
Whitestown	700	Lafayette	18,116
Lebanon	4,465		

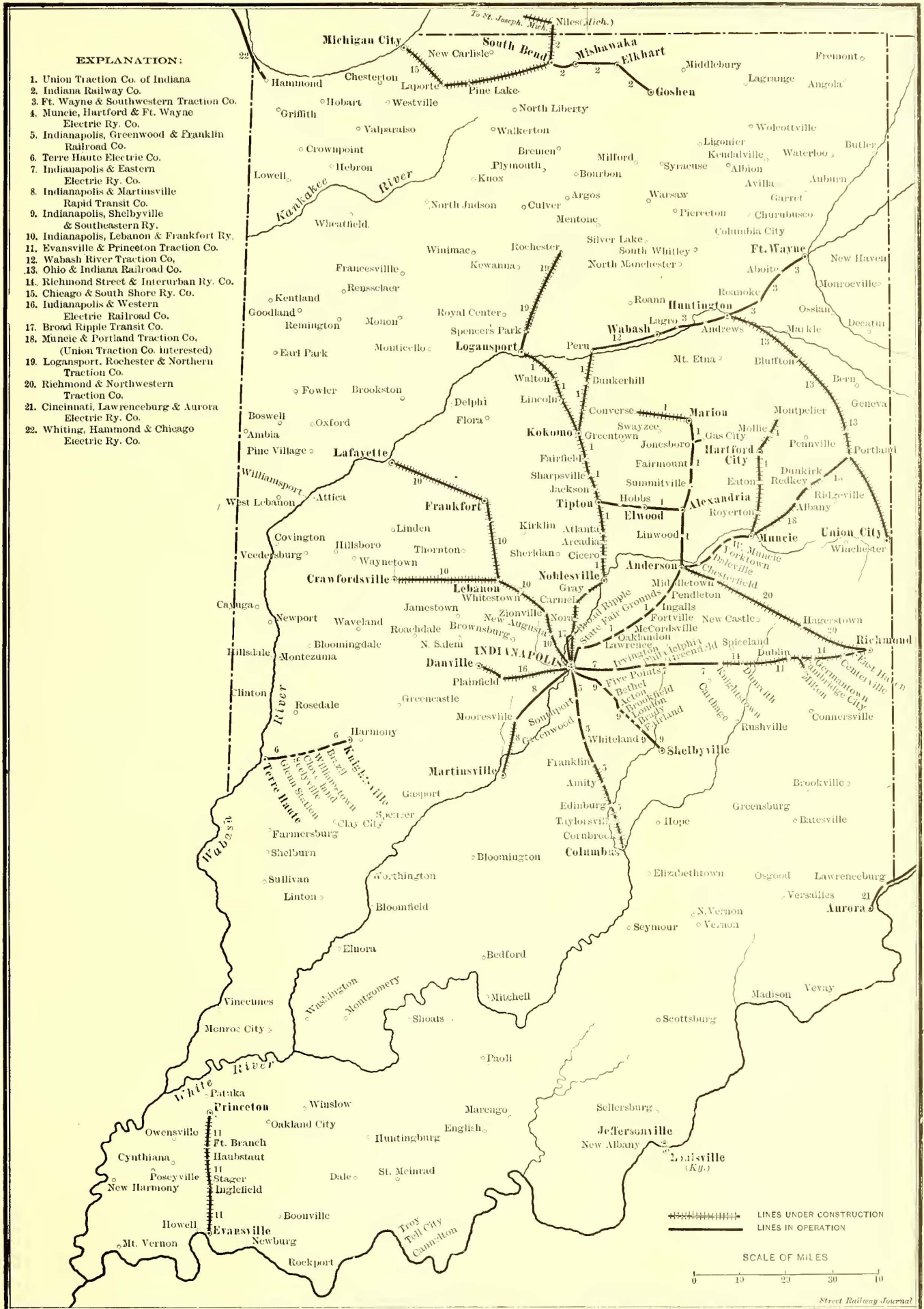
In the southwestern part of the State the Evansville & Princeton Traction Company (No. 11) seems to be the most advanced of any of the projected lines. The towns through which this road is being built are:

Population		Population	
Evansville	59,007	Fort Branch	849
Ingfield	52	Princeton	6,041
Haubstadt	448		

The Wabash River Traction Company (No. 12) connects Wabash with Peru:

Population		Population	
Wabash	8,618	Peru	8,463

The same company expects to connect Peru and Logansport. The Ohio & Indiana Railroad Company (No. 13) has done part of the grading for a line from Huntington to Union City, as indicated. Bracey & Howard, contractors, Chicago, are behind the



MAP OF INDIANA, SHOWING INTERURBAN ELECTRIC RAILWAYS

road, S. H. Bracey, of that firm, being vice-president. The towns served and populations are as follows:

Population		Population	
Huntington .....	9,491	Portland .....	4,798
Bluffton .....	4,479	Union City .....	2,716

The Richmond Street & Interurban Railway (No. 14) has a line just being completed from Richmond as far west as Dublin and the line from there to Greenfield, to connect with Indianapolis, is under contract. The towns along this route are:

Population		Population	
Richmond .....	18,226	Dublin .....	698
Centerville .....	785	Dunreith .....	205
East Germantown .....	305	Knightstown .....	1,942
Cambridge City .....	1,754	Greenfield .....	4,489

The Chicago & South Shore Railway Company (No. 15) is just completing a line from Laporte to Michigan City. This is being built by the Electrical Installation Company, of Chicago. W. C. Burns, of Chicago, formerly president of the Indiana Railway Company, is president.

Population		Population	
Laporte .....	7,113	Michigan City .....	14,850

The Indianapolis & Western Electric Railroad Company (No. 16) is building west from Indianapolis to Plainfield.

Population		Population	
Indianapolis .....	169,164	Plainfield .....	909

Albert Lieber, of Indianapolis, 1001 Stevenson Building, is president, and the Electrical Installation Company, of Chicago, electrical engineer of the company.

The Cincinnati, Lawrenceburg & Aurora Electric Railway Company (No. 21) runs from Cincinnati to Aurora by way of Lawrenceburg, serving a considerable population in the extreme southeastern part of the State. The Whiting, Hammond & Chicago Electric Railroad (No. 22) runs between Chicago and Hammond, serving a large population in the northwest corner of the State.

There are a number of additional lines projected, including a trunk line from Indianapolis to Springfield, Ill., by way of Terre Haute; and from Indianapolis to Cincinnati, by way of Rushville and Hamilton, Ohio.

The Indianapolis Terminal Traction Company proposes to expend \$1,200,000 in the construction of terminal loops, passenger and freight stations, making the most systematic and advantageous terminal system for interurban roads to be found in the country.

### Club Rooms for Employees of Washington Company

The members of the Washington Traction & Relief Association, composed of employees of the Washington Traction & Electric Company, have recently been presented a handsome clubhouse on behalf of the company by Gen. George H. Harries, the vice-president and general manager.

The building that has been fitted up for the use of the association has been known to several generations of Washington as Marini's Hall, and was for years occupied by the Government as a storage place for the records of the Census Office. The building has been thoroughly renovated, about \$4000 having been expended in this work. It is a long, broad structure, and contains two great halls on the first and second floors, with numerous smaller rooms on the sides. The entrance hall has been entirely repainted, papered, and carpeted. Brass rails lead up to the double doors that open into the main assembly room on the first, or ground floor. This room is about 50 ft. long, and equally as wide, and is provided with pool and billiard tables. The lighting arrangements of the room have been made perfect. The room has been so arranged that a platform can be erected at the northern end and the meetings of the association held in it.

On the left of the entrance a small room has been fitted up as an office for the secretary, and for use as a committee room. Handsome etchings adorn the walls of this apartment and the walls have been finished in a delicate shade that harmonizes with the heavy oak furniture. To the right of the main entrance is the library, a room somewhat larger than the reception room and filled with magazines and periodicals. In a few months it is hoped that this room will be lined with shelves which will overflow with books of the best sort. This room is carpeted and furnished with easy chairs and will be used as a smoking room.

In the rear of the main assembly room is a bowling alley equipped with the most modern apparatus. On the second floor, the old dancing hall is fitted up with six different alleys. This section will be reserved for use of ladies and for those who can not be accommodated on the lower floor. The general public will also be admitted to this larger alley at all times. On the second floor also are the retiring rooms for the association, containing all modern appliances for shower baths, etc.

The first floor of the building will be open to members of the association only, and a small fee will be charged for the use of the pool and billiard tables and the bowling alleys. It costs nothing to patronize the library and smoking-room, however, and it is expected that the men will make themselves at home in the building. The association will maintain the building from the fees received from the amusements and from the dues of its members. The association has about 900 members who enjoy a life insurance and sick benefit.

The celebration which accompanied the presentation of the rooms was presided over by General Harries, who is president of the association, as well as the general manager of the company. General Harries made a short speech, in which he turned over the building to the house committee selected to receive it. The keys were delivered to R. E. Lee, the chairman of the house committee. General Harries spoke of the excellent work of the men and the high standing of the relief association. He referred to the fact that a place of amusement was needed for them and that the company had provided it.

He then introduced John Joy Edson, who made a short address, advising the men to be faithful to their employers and to perform their tasks so that they would become indispensable to the success of the company. He referred to the fact that in this country every man had a chance to become a leader, and that it was upon the employees that the entire success or failure of a business enterprise depended. S. W. Woodward made an address in a similar strain, and he was followed by John B. Larner. The meeting was then turned over to Chairman Lee, of the house committee.

As soon as the meeting was formally turned over to Mr. Lee, the latter advanced to the platform, and in a short speech thanked General Harries and the others on the platform for their presence and advice. He said that the men had received a great deal of good advice from General Harries in times past, and that they had been very successful in its application. As the general manager did not seem to get anything in return for his kindness, he said, it had been determined to reward him in some way on this occasion, and therefore, Mr. Lee said, it gave him great pleasure to present to him, in the name of the relief association, a slight token of their affection and esteem, in the form of a solid gold watch chain with a charm set with a magnificent diamond. On the reverse side of the charm was engraved General Harries' name and the date of the presentation, together with the name of the association which presented it. General Harries was so completely surprised that he lost the power of speech. In a few moments he recovered sufficiently, however, to thank Mr. Lee and the members of the association for the present, but more for the motives which prompted the presentation.

### Observation Cars in Cleveland

An observation trolley car, similar in idea to those in use in some other cities and described in past issues, will be put in commission in Cleveland, by the Cleveland Electric Railway Company "Big Consolidated" lines, next spring, and will make regular trips throughout the city at stated intervals, giving visitors an opportunity to see the town. The fare will be 25 cents, and an attendant will point out the places of interest.

The car for this purpose is now being built. It will be exquisitely appointed and have every luxury. President Andrews, Superintendent Stanley, Secretary Davies and Excursion Agent J. W. Butler began the work of selecting a route last week. The one most favored is:

Start at Public Square, through the business district, wholesale and retail, including a glimpse of the lake front; up Euclid Avenue to Erie, to Prospect, to Case, to Euclid, to Wade Park, past the Boulevard and the universities, to within a block or so of Lake View Cemetery. The car will then turn up East End Avenue to Mayfield Street, where the excursionists will catch a glimpse of Little Italy, the Alta House and the Garfield monument. Passing Mayfield Cemetery the car will turn into Coventry Road to Euclid Heights, the most fashionable of Cleveland's suburbs, down the heights to Cedar Glens, to another part of the Boulevard, to Cedar Avenue west and to Willson Avenue.

Resuming the tour on Willson Avenue south, the car will continue out Broadway, past the numerous rolling mills, to the State Asylum, around the "Y" at Garfield Park, and back by way of the Union Street loop, down town by way of Willson Avenue, Kingsbury viaduct, Orange, Broadway to the Central viaduct, across the flats to Jennings, across the Abbey Street viaduct to Pearl, past the market house, down Pearl to the Superior Street viaduct and over lower Superior Street back to the starting place.



**Plotting Speed-Time Curves—VI**

BY C. O. MAILLOUX

APPENDIX C.

FORMULA FOR TIME VALUES OF SPEED-TIME CURVES

The most convenient and practical way of drawing a speed-time curve is to locate or "plot" on a sheet of paper, the co-ordinates for a certain number of points of the curve, sufficiently close together for the purpose, and to then draw a line passing through or near these points. The more precisely these points have been determined and plotted, and the more numerous they are, the more perfect will be the curve, and the fewer the points which are, so to speak, out of line of the "mean path" through the aggregation of the co-ordinate points.

The data of each case furnish the necessary information regarding the speed, which is the ordinate value for each co-ordinate point of the curve; but they give no direct information about the time value corresponding to each speed value, that is to say, about the horizontal distance of the next ordinate, either from the starting point, or from the last point plotted. Fortunately, the data either give or furnish the information necessary to obtain the value of the differential coefficient, or the time-rate of speed variation, which corresponds to each speed value, and which determines the inclination or slope of the curve at that particular speed point. Taking advantage of this circumstance, a formula for pre-determining the time values corresponding to the speed values, may be obtained by the solution of a simple geometrical problem. This problem may be stated as follows:

Given the ordinate ( $y$ ) and the differential coefficient ( $dy/dx$ ) at any point of a curve to find the abscissa ( $x$ ) corresponding to said ordinate, or the distance of said ordinate from the axis of ordinates ( $OY$ ).

There are two cases:

First.—Curves having a positive differential coefficient, or an upward slope.

These curves are generally concave to the axis of  $x$ .

This case includes all acceleration curves.

Second.—Curves having a negative differential coefficient, or a downward slope.

These curves are generally convex to the axis at  $x$ .

This case includes all retardation curves.

First Case.—(Fig. 17). Let dotted lines,  $a-b$ ,  $c-d$ ,  $e-f$ , be drawn tangent to the curve  $OEF$  at various points. Let the vertical lines,  $y$  and  $y'$ , be ordinates which are very close together and correspond to the point of tangency ( $E$ ). The time space or difference ( $dx$ ) between these ordinates, or

$$dx = x' - x \tag{a}$$

and the difference between the ordinates, or the speed increment

$$dy = y' - y \tag{b}$$

are both assumed to be infinitely small.

By similar triangles, we have

$$\frac{y}{cx} = \frac{dy}{dx} \tag{c}$$

Or the ordinate ( $y$ ) at the point of tangency, divided by the "sub-tangent" ( $cx$ ) is equal to the differential coefficient for the said point. The numerical value ( $k$ ) of this differential coefficient is known, or can be calculated from the data of the case, so that we have

$$\frac{dy}{dx} = k$$

whence

$$dx = \frac{dy}{k} \tag{d}$$

It should be noted that  $dx$  is really the sub-tangent of the small or differential triangle  $E dy dx$ .

Equation (d) may also be written

$$dx = dy \times \frac{1}{k} \tag{e}$$

This means that the time element  $dx$ , corresponding to the infinitely small change in speed  $dy$ , is equal to this change in speed multiplied by the reciprocal of the differential coefficient. The total time  $x'$  would be, from (a)

$$x' = x + dx \tag{f}$$

Such time increment values ( $dx$ ) would be too small for practical use in plotting curves, however.

NOTE.—The first instalment of this paper appeared in the STREET RAILWAY JOURNAL July 5, and contained Figs. 1 to 4; the second part, July 26, and contained Figs. 5 to 10; the third part, Aug. 9, and contained Figs. 11 to 13; the fourth part, Aug. 16, and contained Fig. 14, and the fifth part, Aug. 23, and contained Figs. 15 and 16.

If we increase the difference between  $x$  and  $x'$ , we will have, instead of equation (a) and (b), the following:

$$x' - x = \Delta x \tag{g}$$

$$y' - y = \Delta y \tag{h}$$

and equation (c) will become

$$\Delta x = \Delta y \times \frac{1}{k} \tag{i}$$

while equation (f) will become

$$x' = x + \Delta x \tag{ii}$$

when  $\Delta y$  = the speed increment corresponding to the time increment  $\Delta x$ .

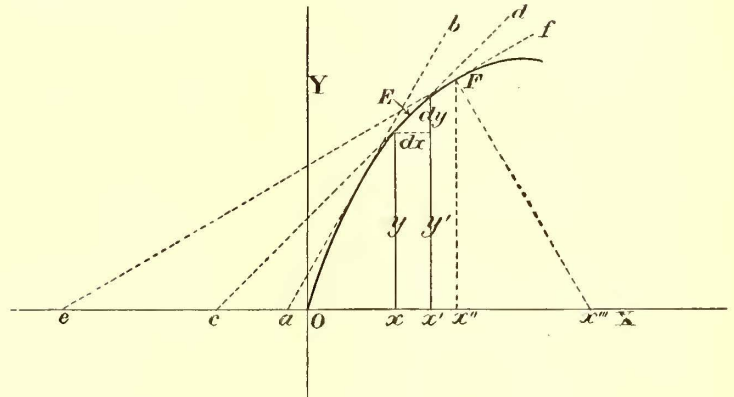


FIG. 17

An important question arises in this case, however. So long as the time difference was very small ( $= dx$ ), and the ordinates  $y$  and  $y'$  remained very close to each other, the differential coefficient had substantially the same numerical value ( $k$ ) at the ordinate  $y$  as at the ordinate  $y'$ , and no substantial error would result from taking either of the two values of this coefficient.

When the time distance is increased (to  $\Delta x$ ), however, the differential coefficients at the two ordinates  $y$  and  $y'$  may be made

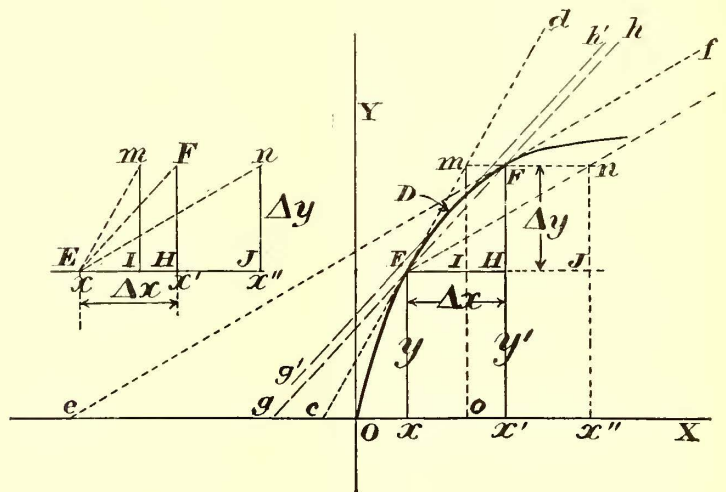


FIG. 18

terially different. This is illustrated in Fig. 18, where the conditions are purposely exaggerated. In this case we have

$$\frac{dy}{dx} = \frac{y}{cx} = k \tag{j}$$

at the point  $E$ , and

$$\frac{dy'}{dx'} = \frac{y'}{cx'} = k' \tag{k}$$

at the point  $F$ ,

the two being evidently different in value, and one being evidently larger, the other smaller, than the differential coefficient corresponding to some intermediate point of the curve, such as  $D$ , between  $E$  and  $F$ . If we draw the line  $g, h$ , parallel to the tangent line  $g', h'$ , we have the differential triangle  $E F H$ , exactly similar to the differential triangle corresponding to the point  $D$ , and we can write

$$\frac{dy''}{dx''} = \frac{\Delta y}{\Delta x} = k'' \tag{l}$$

where  $y''$ ,  $x''$  are the co-ordinates of the point  $D$ , and  $k''$  = the differential coefficient thereof.

The differential triangles  $E m I$  and  $E n J$  correspond, respectively, to the co-ordinates of the points  $E$  and  $F$  and to their differential coefficients,  $k$  and  $k'$ , as defined in equations (j) and (k). These two differential triangles and the differential triangle  $E F H$  are reproduced by themselves in the left-hand portion of Fig. 18.

As pointed out in connection with equation (d) the sub-tangent of the differential triangle is the time increment ( $\Delta x$ ) in each case. Hence, the three triangles show graphically the different values of  $\Delta x$  obtained by equation (i) when, with the same value of  $\Delta y$ , the different values of the differential coefficients ( $k, k'', k'$ ) corresponding to the points  $E, D$  and  $F$ , are used.

It is seen that the intermediate coefficient value  $k''$  is the one giving the correct time increment value ( $\Delta x$ ). The lower value,  $k$ , makes the time increment too small by the distance  $I H$ ; while the higher value,  $k'$ , makes it too large by the distance  $I m$ . The point  $D$  is approximately midway between the points  $E$  and  $F$ . If the curve had a constant rate of curvature, like the arc of a circle, the point  $D$  would be exactly midway; it would be shifted to the left if the rate of curvature is decreasing, and to the right if the rate of curvature is increasing. In practice the error in the value of time increment ( $\Delta x$ ) will be negligible if the value of the differential coefficient is that corresponding to the midway point or the mean ( $y''$ ) of the two speed values  $y, y'$ , such that

$$y'' = \frac{y + y'}{2}$$

and, of course, the nearer the two values  $y$  and  $y'$  are to each other (or the smaller  $\Delta y$  is taken), the smaller the error.

The error made may easily be calculated. If we designate it by  $\Delta x$  we may write, from equation (i)

$$\begin{aligned} \Delta x &= \Delta x' - \Delta x'' \\ &= \frac{\Delta y}{k'} - \frac{\Delta y}{k''} \\ &= \Delta y \left( \frac{1}{k'} - \frac{1}{k''} \right) \\ &= \Delta y \left( \frac{k'' - k'}{k' k''} \right) \end{aligned} \tag{1}$$

where

$$\begin{aligned} \Delta x &= \text{amount of error,} \\ \Delta x'' &= \text{the wrong value,} \\ \Delta x' &= \text{the correct value,} \end{aligned}$$

and the proportion of error would be,

$$\frac{\Delta x}{\Delta x'}$$

The above equation (1) in reality gives the difference in time value resulting from having assumed some greater or less value than the proper value ( $k'$ ) of the differential coefficient. If the value of  $k''$  was taken too great (which is the case symbolized by the differential triangle  $E m I$ ), the factor  $k'' - k'$ , and consequently the value of  $\Delta x$ , representing the correction for error, will have the positive sign. On referring to the first line of equation (1) we see that  $\Delta x$  can only have the plus sign when  $\Delta x''$  or the "wrong" time value is less than  $\Delta x'$ , the correct time value. Hence, the plus sign will mean that the correction is to be made by adding the amount  $\Delta x$ , obtained by equation (1), to the "incorrect" time value ( $\Delta x'$ ), previously obtained. If the value of  $k''$  was taken too small (as in the case symbolized by the differential triangle  $E n J$ ), the sign of  $\Delta x$  will be *negative* showing that this amount  $\Delta x$  is to be subtracted from the incorrect amount,  $\Delta x'$ .

In practice, the speed differences ( $\Delta y$ ) between any two successive points of the curve are expressed in miles per hour, or fractions thereof, and the time values  $\Delta x$  are taken in seconds.

Equation (1) shows that the error would increase in direct proportion with the speed increment ( $\Delta y$ ), and in inverse proportion with the product of the reciprocals of the two differential coefficients considered.

[NOTE.—Usually  $k'$  and  $k''$  have very nearly the same values, hence the product  $k', k''$  is very nearly equal to the square of either  $k'$  or  $k''$ .]

The total time value or the abscissa ( $x'$ ) corresponding to any speed point ( $y'$ ) is obtained, as indicated in equation (ii) by adding the latest time value ( $\Delta x$ ) to the sum of all the previous values. This summation of previous values is symbolized by  $x$  in equation (ii).

Second Case.—(Fig. 19). The dotted line,  $c-d$ , being drawn tangent to the point  $E$ , we have, by similar triangles

$$\frac{dy}{dx} = \frac{y}{x d} \tag{m}$$

just as in equation (c). In this case, however, we observe that the symbol  $dy$  represents a diminution of speed, because  $y$  is greater than  $y'$ , and, consequently, if we applied equation (b) we would have

$$y' - y = - dy \tag{n}$$

since  $y = y' + dy$ .

Hence, equation (m) should be written

$$-\frac{dy}{dx} = -\frac{y}{x d} = -k \tag{n}$$

and we have, by analogy to equation (e)

$$dx = - dy \times \frac{1}{k} \tag{o}$$

and by analogy to equation (i),

$$\Delta x = - \Delta y \times \frac{1}{k} \tag{p}$$

or the successive time increments,  $\Delta x$ , correspond to descending speed values ( $-\Delta y$ ), in the curve.

In this case, as in the first case, there will be an error, if the wrong differential coefficient is used in applying equation (p).

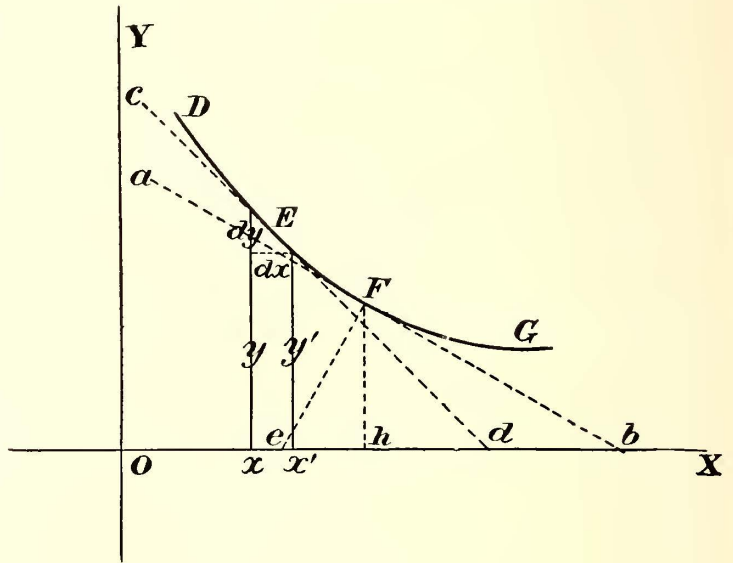


FIG. 19

This error has, however, a slightly different expression, resulting from the negative sign in (p).

Using the same notation as before, we have

$$\begin{aligned} \Delta x &= \Delta x' - \Delta x'' \\ &= -\frac{\Delta y}{k} \left( -\frac{\Delta y}{k''} \right) \\ &= \frac{\Delta y}{k''} - \frac{\Delta y}{k'} \\ &= \Delta y \left( \frac{k' - k''}{k'' k'} \right) \end{aligned} \tag{q}$$

In this case a positive sign for  $\Delta x$  will mean that the incorrect value ( $\Delta x''$ ) is too large, and must be reduced by an amount equal to  $\Delta x$ . Since the general form of equation (q) is the same as that of equation (1), the remarks already made concerning the proportionality of the error will also apply to this case.

The practical significance and application of the foregoing analysis and reasoning are as follows:

Accuracy in plotting speed-time curves requires that:

First.—The speed points should not be taken too far apart (or the speed differences should not be taken too great).

Second.—The "flatter" the curve (or the smaller the rate of acceleration), the smaller the speed differences ought to be.

Third.—For high accelerations (corresponding to the lower portions of acceleration curves), the speed differences may be taken from 1 mile per hour to 10 miles per hour, or even higher, according to the degree of precision required.

Fourth.—For low accelerations the speed differences must be gradually reduced as the rate of acceleration decreases (as in the flat parts of acceleration curves), until it amounts to a small fraction of a mile per hour—from five-tenths to one-tenth or less, according to the degree of precision required.

Fifth.—The speed increment ( $\Delta y$ ) should be reduced whenever it gives by equation (i) a too high time increment value ( $\Delta x$ ). The time value may be considered high when it exceeds two seconds for high accelerations, five seconds for medium accelerations, and ten seconds for low accelerations. For very accurate work, the limits ought to be set considerably lower, or one-half second for high accelerations, two seconds for medium accelerations, and five seconds for low accelerations.

These observations have been verified and confirmed by practical experience.

APPENDIX D.

BRAKE CURVE PROBLEMS

To plot any portion of a braking curve which follows or which is assumed to follow a straight line, we only need to determine the co-ordinates of the first and last points of the said portion of curve.

The three following "problems" show how the co-ordinates may be determined in different cases.

Problem I.—At what speed point must the brakes be applied in order to bring the car to a stop at an exact given point, the rate of retardation being constant and known or assumed?

This problem is the same as that of finding the point *g* in Fig. 20.

Let ordinates (*y*) represent speeds (m. p. h.)

Let abscissæ (*x*) represent time (seconds)

Let *s* = distance, in miles.

Let *A* = area (m. p. h. seconds).

It has been shown in Appendix A (equation *e*) that the area of any portion of a speed-time curve is equal to a distance.

In this case the rate of retardation being assumed constant, and the speed-line being consequently straight, the area of the portion considered (*h g B*), is the area of a right-angled triangle, which, it is well known, is equal to

$$A = \frac{yx}{2} \tag{a}$$

In this case the value of *x* is not given. We can obtain it, however, from the rate of retardation

$$\frac{dy}{dx} = k \tag{b}$$

Since *k* is assumed constant, we may write  $y/x = k$ , whence

$$x = \frac{y}{k} \tag{b}$$

Substituting this value in (a) we have

$$A = \frac{y^2}{2k} \tag{c}$$

The speeds being taken in miles per hour, and the time values in seconds, the area value will be expressed in m. p. h. seconds. A train moving with a velocity of one mile per hour for one hour would cover a distance of exactly one mile. There being 3600 seconds in one hour, it follows that 3600 m.p.h.-seconds of area are equivalent to one mile of distance. Hence, dividing the area *A* by 3600, we have distance *s* in miles, or

$$s = \frac{A}{3600} = \frac{y^2}{2k \cdot 3600} = \frac{y^2}{7200k} \tag{d}$$

from which, solving for *y*, we have

$$y^2 = 7200ks$$

$$y = \sqrt{7200ks} \tag{e}$$

which is the speed point "g" in Fig. 20.

The time value (*x*) will be (from equation b)

$$x = \frac{y}{k} = \frac{\sqrt{7200ks}}{k} \tag{f}$$

Problem 2.—At what speed must braking begin in order to travel a specific distance and still have a certain definite speed, the rate of retardation being constant and known or assumed?

This problem may also be stated as follows:

Given the speed value (e) which a car must still have after having passed over a given distance while being braked, and under a constant given rate of retardation, to find the initial speed value (c) at which the braking must begin.

The area of the portion of curve under consideration (*b, c, e, f*) is equal to the mean of the ordinates multiplied by the abscissa, or

$$A = \frac{(Y+a)x}{2} = (Y+a) \frac{x}{2} \tag{g}$$

The value of *x* is obtained, as in the previous problem, by reference to the rate of retardation

$$\frac{dy}{dx} = k \tag{h}$$

This equation, it is evident, applies only to the upper or triangular portion, *ice*, of the whole area. Hence, the value of *y*, as given in equation (b) must be taken to mean, in this case, that portion of *y'* which is above the point *i*. This portion is

$$y = Y - a$$

which value, substituted for *y* in equation (b), gives

$$x = \frac{Y-a}{k} \tag{i}$$

This value, substituted in equation (g), gives

$$A = \frac{(Y+a)(Y-a)}{2k}$$

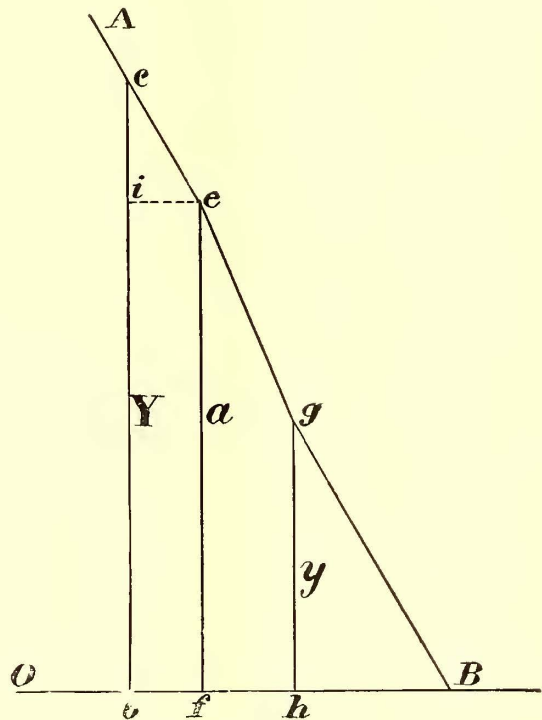


FIG. 20

$$\frac{Y^2 - a^2}{2k} \tag{j}$$

Dividing by 3600, as before, we have

$$s = \frac{A}{3600} = \frac{Y^2 - a^2}{7200k} \tag{k}$$

whence, solving for *Y*,

$$Y^2 = 7200ks + a^2$$

$$Y = \sqrt{7200ks + a^2} \tag{l}$$

The value of *Y* is the speed at the point *c* in the curve.

Problem 3.—What will be the distance covered when braking for the purpose or reducing the speed from a given initial value to a given final value, the rate of retardation being constant and being known or assumed?

The solution of this problem is easily obtained by solving for *s*, in equation (i) of Problem 2. The solution gives:

$$s = \frac{Y^2 - a^2}{7200k} \tag{m}$$

[NOTE.—In all three of the preceding problems *k* is the resultant retardation, and its value is to be obtained according to the formula in equation (X) given in Section II of the paper.]

APPENDIX E.

USE OF METRIC SYSTEM

When the metric system of measurement is used the formulæ and methods of plotting mentioned in this paper will still apply, if modified so as to make due allowance for the difference between the metric and English units employed for measuring distance, speed and weight.

The usual practice, in all countries where the metric system is

in use, is to measure train speed or car speed (*i. e.*, "amount of velocity") in "kilometers per hour," a term of measure analogous to our term "miles per hour." The logical term or unit of measure for acceleration (*i. e.*, rate of velocity), or for the quantity termed the "acceleration coefficient" in the paper, would be "kilometers per hour" per second, which would be analogous to our term "miles per hour" per second. For some reason, however, this unit does not seem to be much used, if at all. The unit of acceleration generally used by European engineers is the "meter per second per second," which is analogous to our "foot per second per second." It certainly would be more logical and less confusing to express both amount and rate of velocity in like terms, using either kilometers per hour, only, or meters per second, only, for the amount, and the same unit *per second* for the rate of velocity (acceleration coefficient).

Train weights, according to the usual practice, when using the metric system, are expressed in metric tons (2204.6 lbs.).

Time values are expressed in seconds, minutes or hours, just as in the English system.

The following table gives, for both systems, the corresponding values of certain quantities which enter in the equations employed in the paper:

WEIGHT	
Metric Unit	English Unit
1 kilogram	= 2.2046 lbs.
0.4536 kilogram	= 1.0 lbs.
1 ton	= 1.1023 ton of 2000 lbs
0.9072 ton	= 1.0 ton of 2000 lbs.
DISTANCE	
1 meter	= 3.281 ft.
0.3048 meter	= 1.0 ft.
1 kilometer	= 3281 ft.
1 kilometer	= 0.6214 mile.
1.609 kilometer	= 1.0 mile.
VELOCITY	
1 meter per second	= 3.281 ft. per second.
1 meter per second	= 2.24 miles per hour.
1 meter per second	= 3.6 kilometers per hour.
0.305 meter per second	= 1 ft. per second.
0.447 meter per second	= 1 mile per hour.
1 kilometer per hour	= 0.621 mile per hour.
ACCELERATION	
1 meter per second per second	= 1 "A" unit of acceleration. = 2.24 m. p. h. per second.
1 kilometer per hour per second	= 1 "a" unit of acceleration. = 0.621 m. p. h. per second.
0.447 "A" unit	= 1.0 m. p. h. per second.
1.609 "a" unit	= 1.0 m. p. h. per second.
1 "A" unit	= 3.6 "a" units.
1 "a" unit	= 0.278 "A" units.

We now proceed to investigate the effect of these changes in numerical value on the equations given in the paper.

Appendix A.—The same equations will all apply without change. If distance (*s*) is expressed in meters and time in seconds, then velocity (*v*) will be expressed in "meters per second." If distance is expressed in kilometers and time in hours, velocity will be expressed in "kilometers per hour."

Appendix B.—Equations (1) to (16) will apply without change, the symbols *v*, *s*, *g*, *w*, being taken in suitable metric units. All the other equations require modification.

In equation 1a when energy (*E*) is expressed in kilogram-meters, and distance (*s*) is expressed in meters, force (*F*) will be measured in kilograms of (pushing or pulling) effort.

The metric value of *g* being taken as 9.81 (meters per second), and *w* being taken in kilograms, we will have for equation (17)

$$M = \frac{w}{g} = \frac{w}{9.81} = .102 w \quad m(17)$$

and for equation (18a)

$$A = \frac{F}{.102 w} = \frac{F}{w} 9.81 \quad m(18a)$$

the force, *F*, being expressed in kilograms (not dynes) of effort. Thus, when the force (*F*) and the weight acted upon (*w*) are both equal to 1 kg (as in the case of a body falling vertically in vacuo), the rate of acceleration will be 9.81 meters per second per second. If the weight of a train, *w*, is to be expressed in metric tons, we will have

$$w = 1000 W$$

where *w* = weight in kilograms

and *W* = weight in tons of 1000 kilograms

Substituting for *w*, in equation 18a, we have

$$A = \frac{9.81 F}{1000 W} = .00981 \frac{F}{W} \quad m(18b)$$

This equation may be used instead of equation 21a if velocity is to be expressed as a space-rate per second instead of per hour. To transform the equation into one expressing acceleration in kilometers per hour per second, we note from the preceding table of equivalents that

$$1 \text{ m per second} = 3.6 \text{ km per hour.}$$

Hence, equation (19) becomes

$$3.6A = a \quad m(19)$$

$$A = \frac{a}{3.6}$$

whence

Substituting in equation 18b we have the equivalent form of equation 21a, or

$$\frac{a}{3.6} = .00981 \frac{F}{W}$$

whence  $a = .03532 \frac{F}{W}$  m(21a)

The values of *F* and *W* will, of course, depend on whether acceleration is to be expressed in terms of "A" or of "a."

Solving for *F* we will have, from equation *m* (18b),

$$F = \frac{W A}{.00981} = 101.94 W A; \quad m(22a)$$

and from equation *m* (21a)

$$F = \frac{W A}{.03532} = 28.31 W a \quad m(22)$$

Solving for *W* we will have, from equation *m* (18b),

$$W = .00981 \frac{F}{A} \quad m(23a)$$

and from equation *m* (21a)

$$W = .03532 \frac{F}{a} \quad m(23)$$

Equation (24) remains unchanged, but the numerical value of *P* will evidently depend upon whether the value of *F* be taken from equation *m* (22a) or from equation *m* (22); in other words, it will depend upon the unit of acceleration assumed (whether "A" or "a").

Equations (25, 25a and 26) will retain the same form, the constant 91.1 being, of course, replaced by either of the corresponding metric constants given in equations *m* (22a) or *m* (22), according to the unit of acceleration adopted.

The last three equations will also retain the same form, and the values obtained for *A'* will likewise depend upon the unit of acceleration adopted.

The time-rate of velocity "k" will evidently have a different numerical value, according to the unit of acceleration used. Equation *m* (19) shows that its numerical value will be 3.6 greater when acceleration is expressed in kilometers per hour per second ("a" units) than when it is expressed in meters per second per second ("A" units).

Appendix C.—All the equations retain the same form. The numerical values obtained by means of the various formulæ will obviously depend upon the units of speed and acceleration adopted, since these govern the values of the speed increments ( $\Delta y$ ) and of the acceleration coefficients (*k*).

Appendix D.—When velocity (*y*) is expressed in kilometers per hour the equations will all retain the same form. Distances will then be measured in kilometers, the values taken for *k* being those obtained by reference to equation *m* (21a). When velocity is expressed in meters per second, the constant 3600 disappears from equations (d) (e) (f) (k) (l) (m). Distances will then be measured in meters, the values taken for *k* being those obtained by reference to equation *m* (18b).

The modified forms of these equations (which, it should be carefully noted, apply only when acceleration is measured in "A" units) will be:

$$s = \frac{y^2}{2 k} \quad m(d)$$

$$y = \sqrt{2 k s} \quad m(e)$$

$$x = \frac{\sqrt{2 k s}}{k} \quad m(f)$$

$$s = \frac{Y^2 - a^2}{2k} \quad m(k)$$

$$y = \sqrt{2ks + a^2} \quad m(I)$$

$$s = \frac{y^2 - a^2}{2k} \quad m(m)$$

Specific Equations.—The equations (I) to (XII) inclusive, contained in the body of the paper are mostly derived or adapted from the general equations given in the Appendix, Sections A, B, C, D of the paper.

The following table gives, in parallel columns, the modified forms of each of these equations, when adapted for the metric system:

TABLE III. (APPENDIX E)

No	First Term Same for All	LAST TERM OF EQUATION		
		As Given in the Paper	Modified for Metric System	
			For "A" Units	For "a" Units
I	$\frac{dv}{dt}$	$= k \pm k' \pm k'' \pm \text{etc.}$	same	same
II	F	$= .01098 \frac{F}{W}$	$= .00981 \frac{F}{W}$	$= .03532 \frac{F}{W}$
III	A'	$= \frac{.01098}{W} (p \pm p' \pm \text{etc.})$	$= \frac{.00981}{W} (p \pm \text{etc.})$	$= \frac{.03532}{W} (p \pm \text{etc.})$
IV	A'	$= .01098 (p \pm p' \pm \text{etc.})$	$= .00981 (p \pm \text{etc.})$	$= .03532 (p \pm \text{etc.})$
V	A'	$= .01098 (P - f - c \pm G)$	$= .00981 (P - f - c \pm G)$	$= .03532 (P - f - c \pm G)$
VI	p	$= P - f - c \pm G$	same	same
VII	-A'	$= .01098 (-f - c \pm G)$	$= .00981 (-f - c \pm G)$	$= .03532 (-f - c \pm G)$
VIII	-A'	$= -.01098 f$	$= -.00981 f$	$= -.03532 f$
IX	-A'	$= -.01098 (-B - f - c \pm G)$	$= -.00981 (-B - f - c \pm G)$	$= -.03532 (-B - f - c \pm G)$
X	-A'	$= -1.647 \pm (.01098 G)$	$= -.736 \pm (.00981 G)$	$= -2.65 \pm (.03532 G)$
XI	N	$= \frac{b}{20}$	$= \frac{b'}{22}$	$= \frac{b'}{22}$
XII	G	$= .05 Nb$	$= .045 Nb$	same

\* Where b' = increased train resistance in kilograms per degree of track curvature.

Metric Curve Plotting.—The methods of curve plotting described in the paper can also be employed in plotting "metric" speed-time curves. In using the chart method, however, special "metric" charts of acceleration coefficients and of reciprocals will be required; and these charts will have to be prepared with special reference to the particular unit of acceleration employed.

Chart of Coefficients.—If acceleration is to be measured in "A" units (*i. e.*, in meters per second per second) the ordinates in the chart of coefficients will represent values of the acceleration coefficients, such as determined by equation *m* (18b), and the abscissæ will represent speeds, expressed in meters per second. If acceleration is to be measured in "a" units (*i. e.*, in kilometers per hour per second) the ordinates will represent values of the acceleration coefficients such as determined by equation *m* (21a), and the abscissæ will represent speeds expressed in kilometers per hour.

If the chart of coefficients is to have approximately the same range as the chart shown in Fig. 9, the scales must be approximately as follows: For "A" units of acceleration the scale of coefficients (ordinates) must read to about 1.2 ms per second per second, and the scale of abscissæ must read to about 32 ms per second; for "a" units of acceleration the scale of ordinates must read to about 4.0 km per hour per second, and the scale of abscissæ must read to about 115 km per hour. The scale divisions should obviously be larger in the chart for "A" units than in the chart for "a" units.

The gradient percentage lines will be straight, just as they are in Fig. 9, but their distances from the axis of *x* will be different in the two cases. A grade of 1 per cent will represent a force (*F*) of 10 kms per ton in both cases, but the numerical value of the acceleration produced by this effort will depend upon the unit of

acceleration used. In "A" units we would have, by equation *m* (18b),

$$A = .00981 \times 10 = .0981 \text{ ms per sec.}^2$$

and in "a" units we would have, by equation *m* (21a),

$$a = .03532 \times 10 = .3532 \text{ kms per hour per second}^2$$

This means that the scale of gradient percentages at the right-hand end of the chart would be such that the line of equivalent acceleration for a 1 per cent grade would be distant from the axis of *x* by an amount equal, respectively, to .0981 ms per second<sup>2</sup> for "A" units, and to 0.3532 kms per hour per second<sup>2</sup> for "a" units, when measured on the scale of acceleration coefficients at the left-hand end of the chart. The corresponding line for a gradient of *n* per cent would, obviously, be placed at *n* times the said distance.

Chart of Reciprocals.—The scale of ordinates in the chart of reciprocals will be the same as in the chart of coefficients, for reasons explained in the paper. The scale of abscissæ may be made as desired. The scale being arbitrary it may be the same for the charts of reciprocals used for both "A" and "a" units.

Use of Charts.—The process of plotting "metric" speed-time curves by means of the metric chart just described is substantially the same as indicated in the paper for plotting curves by means of the charts shown in Figs. 9 and 10.

(Conclusion.)

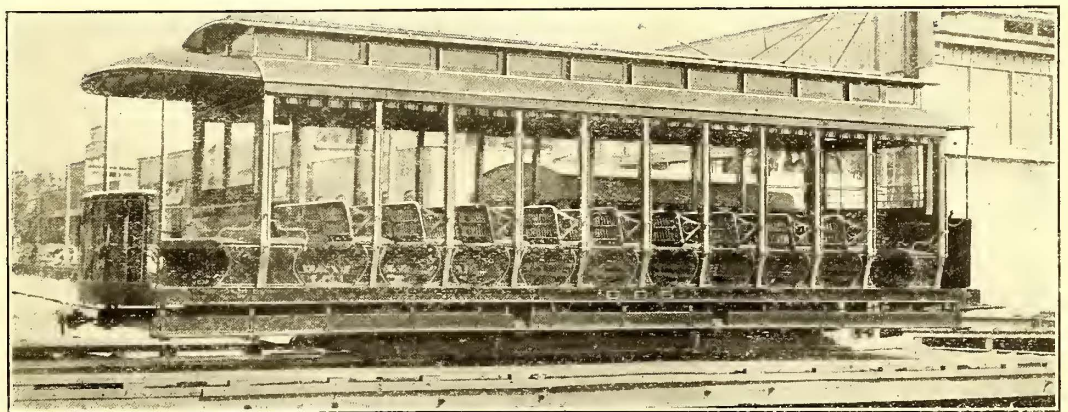
### To Examine American Roads

Lieutenant-Colonel Horatio A. Yorke, chief inspecting officer of railroads for the Board of Trade, has been commissioned to prepare a report on the workings of American railroads, with the view of adopting American railroad methods in Great Britain. Colonel Yorke will only be able to spend a month in the United States, but expects to have a busy time, as, in addition to reporting on the steam lines, he is commissioned to investigate the street railroad systems, elevated roads, subways and pneumatic and electric signalling. Lieutenant-Colonel Yorke will confine his inspection chiefly to New York and its vicinity.

### New Open Cars for St. Louis

The St. Louis Transit Company has recently put in service 100 new open cars, built by the St. Louis Car Company. One of these cars is illustrated herewith. The principal dimensions of the car are 27 ft. 6 ins.; length of platform, including bumper, 3 ft.; length of rear platform from inside of dash to center of bulkhead, 4 ft. 6 ins.; length of car body over all, 35 ft.; width of car body at sills, 7 ft. 6 ins.; width over all, including post handles, 8 ft. 8 ins.; height of car from underside of sill to top of trolley board, 9 ft. 3 ins.

The side sills are made of 6 in.-steel channels, and the step



NEW SUMMER CAR FOR ST. LOUIS

hangers are bolted between with filler blocks in the intervening space. The body framing of the car is the best quality of white ash; the seats are of the St. Louis Car Company type, with curvature to make them comfortable for the passengers, as the seats are not reversible, being stationary.

As this is a one-end car only, the brakes are placed only on the front end of the car with the motor, and no passengers are allowed to ride on the front platform. This is one of the longest single-truck car bodies ever turned out for summer passenger travel, and it is giving eminent satisfaction. The spring base of the truck is 22 ft. 4 ins., and the wheel base 8 ft.

### Noise an Element of Damage

In the Superior Court at Boston, Aug. 20, Chief Justice Albert Mason handed down his decision in the case of E. F. Baker against the Boston Elevated Railway Company, holding that where property is damaged by the construction of the railway, the petitioners have a right to recover for the damages caused by the noise occasioned in the operation of the road. The case was a test suit and the railway company contended that the petitioner could not recover for the noise. This decision will materially increase the damages the company will have to pay if the decision of the Superior Court is sustained by the full bench of the Supreme Court. The decision, substantially, is as follows:

"The facts involved in this cause are simple and so far as not agreed present no unusual difficulty of determination. The important question is one of law, whether under chapter 548, Acts of 1894, and chapter 500, Acts of 1897, either or both, the petitioner can recover for damages to his estate from noise, and if so to what extent.

"The two statutes cited, if not as specific as might be, are certainly broad and sweeping. The Legislature is not limited to what the constitution requires when private property is appropriated to public use, but may make the condition of its grant the payment of damages of any class if its purpose to do so is manifest. The requirement of the constitution and the classification of damages adopted in the interpretation of other statutes are of weight in determining the construction of those under which the petitioner claims.

"Injury of a substantial character to a particular estate resulting directly from an unlawful act, creating noisome smells, noxious vapors, dust, smoke or great and disturbing noises, whereby its occupation is rendered inconvenient or uncomfortable, is damage recoverable in a private action, whether the act is also a public wrong, or otherwise. That the maintenance and operation of the respondent's elevated railway as located would be, but for the statute, a private nuisance to the petitioner's estate by reason of great and disturbing noise, quite independent of the fact that it is also an obstruction and impairment of a public right, and, but for the statute, a public nuisance as well, is obvious to any who make intelligent observation on the premises. As a private nuisance it would be of such gravity that, if not beyond the power of the Legislature to legalize it without providing compensation, it is difficult to believe that it was intended to omit such provision except upon the plainest manifestation of such intent. It is believed that each of the propositions thus far stated is supported by the weight of authority, but it cannot be said that there are no decisions or reasoning in reported cases at variance with this view. Time does not permit a critical analysis of all the cases, but it is well to note those cited in the respondent's brief on which counsel lay principal stress as conclusive against the petitioner's right to recover for damage to his estate from noise save to a limited and almost trivial extent."

The Chief Justice considers the cases, and says: "If these decisions can have more than the limited force given them by the dissenting opinion in *Rand vs. Boston*, 164 Mass. 354, they do not go beyond holding that the private nuisance was of that mild type which the Legislature could legalize without provision for compensation, and that the statute did not clearly make such provision. The decisions cited do not establish as a principle of uniform application, even to ordinary surface steam railroads, that the inevitable effects of proximity of the road and its operation to a particular estate are not elements of damages to be recovered, though often quoted as having such effect. The decisions are limited to the facts then before the court. In *Brand vs. Hammersmith & City Railroad Company*, 4, Law Reports 171, the court says: 'Ten trains a day at twenty miles an hour might be no nuisance. This might accommodate the public and pay a dividend; but fifty trains a day at thirty miles an hour might be a grievous nuisance, though much better for the public and for economy.' If this be true of the modern conditions of operating ordinary surface steam railroads, how much more emphatically is it so of an elevated railway upon a metallic structure.

"The petitioner does not claim to recover for damage to his estate resulting from the impairment of facilities for public travel, or from the annoyance or inconvenience to travelers from dust, noise or obstruction of light and air. So far as he or his tenants suffer as travelers, more than others because of making more frequent use of the street for travel, it is not claimed that the injury differs in kind from that sustained by the public. It is not the judicial function to make law but to ascertain and apply it.

"The court finds that the petitioner's estate has been damaged more than it has been benefited or improved in value by reason of the location, construction, maintenance and operation of the respondent's elevated railway, not including any damage resulting from the impairment of the facilities of public travel or

any annoyance or discomfort to any in the use of such facilities, to the extent of \$2,000. The court further finds that one-half of said damage is caused by the noise occasioned by the operation of said railway, and that the damage from noise is \$100 more than if said railway were located wholly in that part of the street of which the fee is not owned by the petitioner. The court rules that the petitioner is entitled to recover the sum of \$2,000 with interest from Sept. 10, 1901, the date of filing the petition.

"At the request of parties made at the trial the case may be reported for the determination of the Supreme Judicial Court, such judgment to be entered as upon the facts found, the law requires."

### Power Brakes for St. Louis Street Cars

The committee appointed by the president's department of the Board of Public Improvements to investigate the practicability of power brakes for street railway cars adopted a report, July 26, which was later presented at the meeting of the Board.

The committee recommends the approval by the Board of the Christensen compressed air brake, with either motor or axle-driven air compressor pump; the Standard (Westinghouse) compressed air brake, with either motor or axle-driven air compressor pump; the Westinghouse electro magnetic track and wheel brake, and the Neal hydraulic brake.

The committee is composed of Hiram Phillips, president of the Board; Joseph P. Whyte, Harbor and Wharf Commissioner; E. A. Hermann, Sewer Commissioner, and Charles Varrelmann, Street Commissioner. The committee visited Pittsburgh, Washington, Philadelphia, New York, Boston, Buffalo, Chicago, Milwaukee and Indianapolis, and examined the street car service in each city. The committee reports that in all of the cities except Washington street car power brakes were in more or less general use. The brakes give satisfaction to the public and owners of the railways, it is stated. The brakes have been in use for two to six years, with the result that the number of accidents has been lessened. The cost of equipping the cars with the brakes has been repaid in from three to five years, by the reduction of the street railway companies' expense account for accidents.

The report contains descriptions and plans of the brakes recommended. It also contains a table showing the approximate distances in which cars can be stopped in cases of emergency. On a level track, with a clean rail, it is stated, a car running at 35 miles an hour can be stopped within 170 ft.; running at 30 miles an hour, within 120 ft.; at 25 miles an hour, within 80 ft.; at 20 miles an hour, within 50 ft.; at 15 miles an hour, within 30 ft.; at 8 miles an hour, within 8 ft., and 4 miles an hour, within 2 ft.

### Earnings of the North Jersey Street Railway in Newark

The North Jersey Street Railway Company is required to file, annually, with the city authorities in Newark, N. J., a statement of its gross receipts in that city. The statement which was filed recently covers the year ending April 30, 1902, and while it does not, by any means, cover all the properties operated by the company, gives a good idea of the growth of the Newark business. The gross earnings of the different divisions, as shown by this report, compared with the preceding year, were as follows:

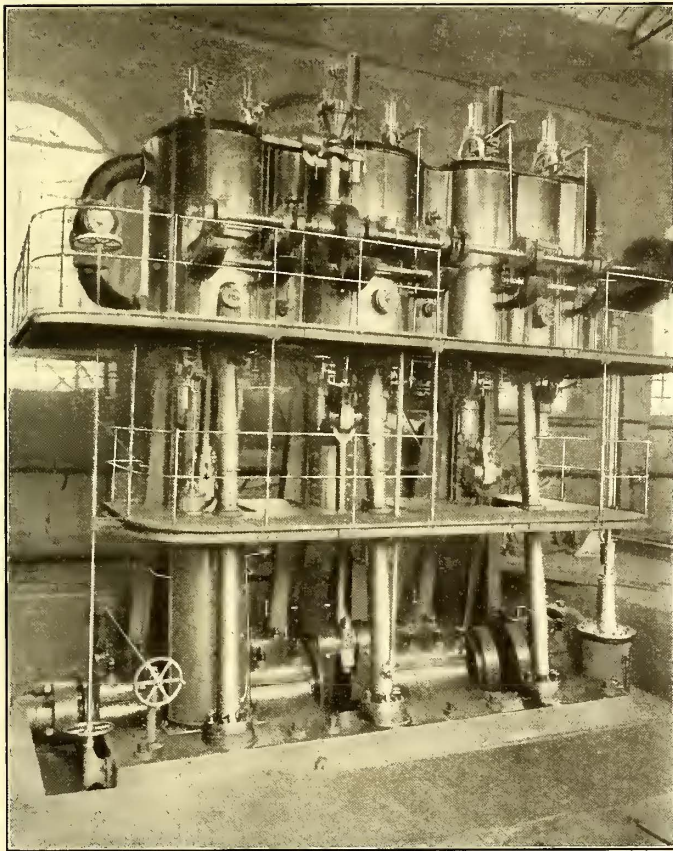
	1902	1901
Plank road .....	\$391,594	\$386,131
Belleville Avenue .....	363,214	390,730
Orange .....	345,140	321,625
South Orange .....	337,048	351,194
Bloomfield .....	239,138	220,149
Turnpike .....	214,569	209,749
Elizabeth .....	154,779	142,923
Paterson .....	123,645	.....
Roseville .....	123,480	115,553
Kinney Street .....	117,438	107,356
Bergen Street .....	108,975	100,108
Forest Hill .....	104,319	132,541
Kearny .....	102,148	96,041
Central Avenue .....	77,712	78,032
Norfolk Street .....	59,309	52,281
Mulberry Street .....	38,827	44,119
Elizabeth Avenue .....	30,971	28,523
Totals .....	\$2,966,699	\$2,777,034

The mileage operated by the company is 267 miles, and as 151 miles of track are located in the city, the tax paid the city is proportioned to that amount.

The earnings of the Belleville Avenue line for 1901 included the Paterson earnings, which are reported separately for 1902. If the earnings of the Paterson line were included with the Belleville Avenue line for 1902 the total would be \$486,859, against \$390,730 for 1901.

### Large Electric Railway Engine for Kiew

American practice in engine construction has been so fully discussed in these pages that it will undoubtedly be of interest to note how some of the European engine builders undertake to design and build a large engine for electric railway work. Among the steam engine manufacturers abroad who have given especial



2000-HP ENGINE FOR RUSSIAN RAILWAY

attention to the electric railway field, there is none, probably, who has done a larger business than Franco Tosi, of Legnano, Italy. Products from the Tosi works are used very extensively in Italy, France, Spain and Austria, as well as to a lesser extent in a number of the northern countries. Through the courtesy of this firm, this paper is able to present in this issue some diagrams and a general view of a 2000-hp vertical triple-expansion engine recently built by them for the power station at Kiew, Russia, of the Russische Elektrizitäts-Gesellschaft "Union."

These engines are of the three-crank type, one crank for each of the three cylinders. An especially interesting feature of them is that all cylinders are fitted out with poppet valve gear, while, with very few exceptions, all of the large vertical engines built heretofore on the Continent, for electrical plants, have a mixed type of steam distribution; that is, poppet valve gear on the horse-power cylinder only and Corliss valve gear on the intermediate and on the low-pressure cylinders. The advantages of the poppet valve, not only with regard to closer regulation when the engine is working with a very light load or at times with no load, but also with regard to its greater adaptability for the use of highly superheated steam, are generally conceded, and it was for this reason that the valves have been applied to all three cylinders.

The first engine of the two ordered for Kiew has just been shipped from the works at Legnano, where it had been erected on a foundation specially built for the purpose of giving it a thorough shop trial.

The dimensions of the cylinders are as follows: Diameter of the high-pressure cylinder, 700 mm. (27½ ins.); diameter of the intermediate cylinder, 1100 mm. (47.2 ins.); diameter of the low-pressure cylinder, 1750 mm. (68.9 ins.); stroke of pistons, 1050 mm. (41.3 ins.). The number of revolutions per minute is 94. All cylinders are jacketed. On the high-pressure cylinder this is done for the sake of having a hard liner in the cylinder and for warming up the cylinder before starting; superheated steam being used. The jacket will not be heated while the engine is working. The jackets on

the intermediate and on the low-pressure cylinders are heated by steam coming from the preceding cylinder.

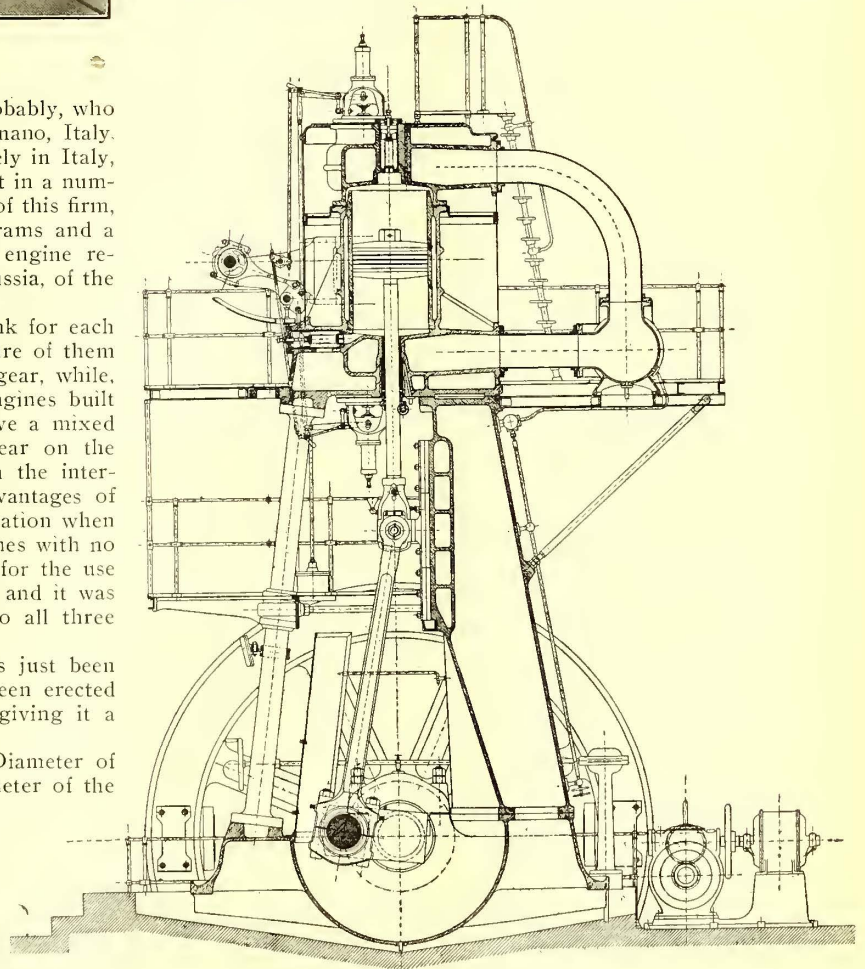
Each cylinder has four poppet valves, two for admission and two for exhaust. As seen in the drawing, they are placed in each head to reduce the waste room to a maximum. The valves of the first and second cylinder, for the purpose of reducing their lift, are made with four seats and, for the same reason, those in the low-pressure cylinder are made with six seats. The latter are probably the only poppet valves of this type ever built.

All the valves take their motion from a revolving shaft carried horizontally on brackets in front of the three cylinders, which shaft, in turn, is driven from the crankshaft by means of two pairs of helical gears and one vertical shaft. The two admission valves on the horse-power cylinder have their valve gear moved by one eccentric, keyed to the revolving shaft acting on one wrist-plate common to both, and the simple trip device is controlled by a Porter governor, which is also driven from the revolving gear-shaft by means of helical gears. All the other poppet valves are moved in pairs of two-admission valves or two-exhaust valves on each cylinder from one wrist-plate common to both, and which is moved by one eccentric keyed on the revolving gear shaft. The wrist-plate is connected, by means of rods, to one end of the "rolling" or "progressive" valve-lever, whose other end is attached to the stem of the poppet valve. This valve gear thus combines the advantages of the quick wrist-plate motion with those of the rolling lever, the valve is lifted slowly and without shock from its seat, and is then opened quickly.

The cut-off in the intermediate and low-pressure cylinder can be regulated by hand within certain limits.

The admission valve in the lower head of the horse-power cylinder is more than counter-balanced by a weight combined with dashpot, in order to secure closure of valve in case of breaking of the spiral spring, thus to guard against running away of the engine. The governor is fitted with sliding weights to vary the speed and also with a safety device which will stop the engine in case of a breakdown of the governor, and which will also enable the engineer, in case of an emergency, to quickly stop the engine by simply moving a lever instead of shutting off the steam at the engine stop valve.

The engine frame consists of three cast-iron stands containing the cross-head guides and of three steel columns, well braced between themselves and the cast-iron stands by cast-iron struts



CROSS SECTION THROUGH HIGH PRESSURE CYLINDER

and wrought-iron tie rods, all mounted on a common bed-plate. This bed-plate is cast in three pieces containing four bearings for the crank shaft. All bearings are lined with a special composition of white metal.

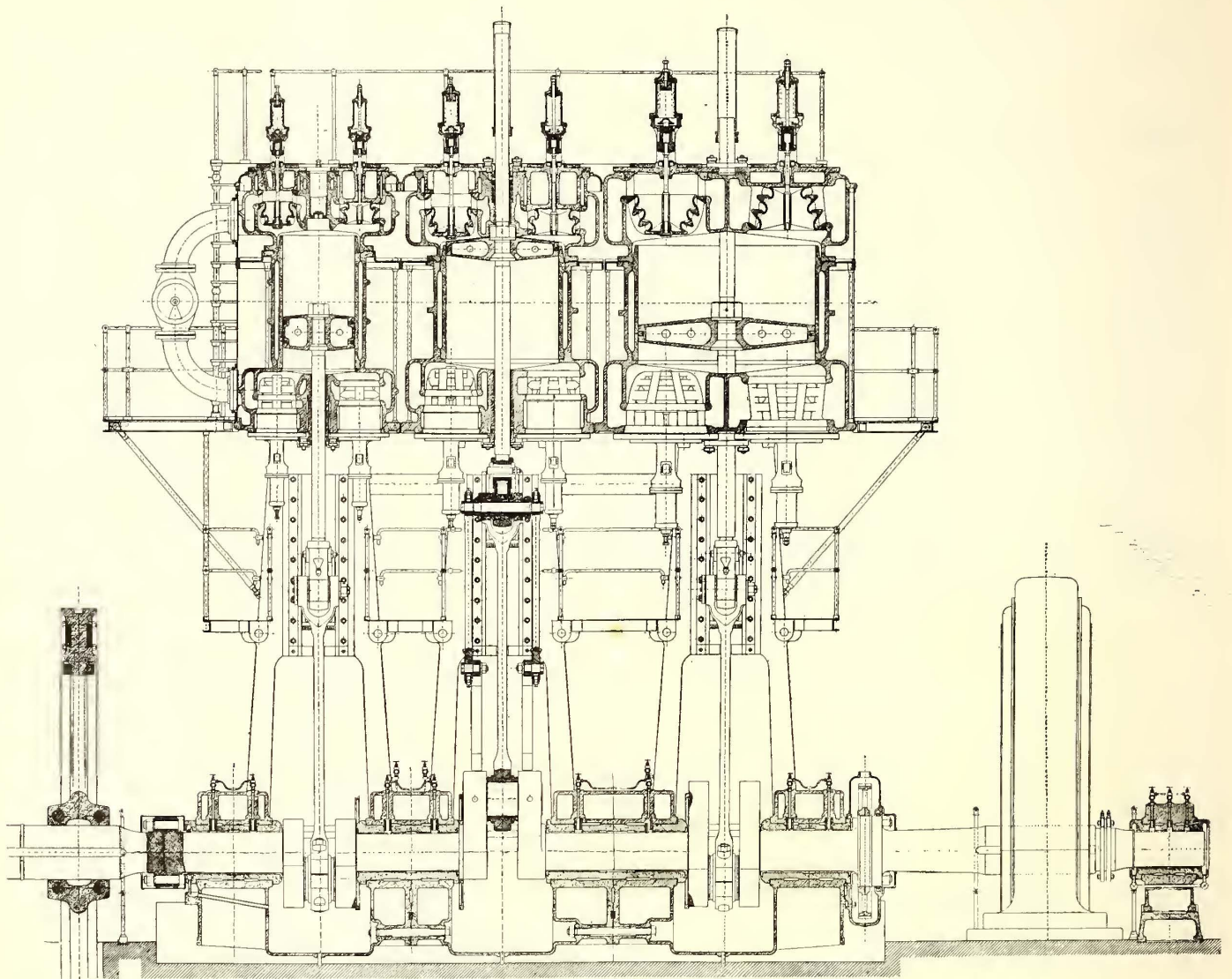
The crankshaft proper is made in two pieces, each piece having one forged "U" crank, one end of which flanged to connect to the dynamo shaft, while the other end has one side-crank shrunk on. These two side-cranks are connected by one crank pin, forming thus the third "U" crank. Of the two dynamo shafts connecting to the flanged ends of the crankshaft, one carries a direct-current generator and a fly-wheel, while the other carries an alternator.

The duplex single-acting air pump which is used in connection with a jet condenser is driven from the cross-head by means of

### Semi-Annual Report of the Bridge Commissioner of New York

The semi-annual report of Bridge Commissioner Lindenthal, of New York, for the first six months of 1902 was published in "The City Record" on Aug. 12. The report is dated July 1, and was submitted to Mayor Low shortly after that time. It goes into detail on all work, mechanical and clerical, that has been done, and mentions all changes in the department since the new administration took office.

The Commissioner believes the Manhattan Bridge will be the most important bridge between New York and Brooklyn, as "it is intended that the Manhattan approach on Canal Street shall be on



LONGITUDINAL SECTION 2000-HP VERTICAL ENGINE, SHOWING VALVE DETAILS

connecting rods and beam. Suction valves are omitted, so that the resistance to the water entering the pump is reduced, and a good vacuum is obtained. The passages for the flow of the water and air are of ample size, in order to secure noiseless running at high speed. All delivery valves are made easily accessible.

All cylinders have direct lubrication to the inside through the top heads, and the high-pressure cylinder has, in addition, three further means for oil lubrication, one through the upper admission valve, one through the lower steam pipe and one through the stuffing box. A sextuple oil pump is driven from the gear shaft of the engine by means of two eccentrics. All of the engine lubrication, that is, of all the journals and guides, is accomplished from a reservoir placed at some height over the engine. The spent oil is collected in a tank located in the basement of the engine room. It is then filtered and pumped up again into the reservoir.

The engine can be turned slowly without steam, if desired, by means of an electric motor, which acts through a worm gear and pinion, and which can be thrown in or out of contact with an internal gear on the rim of the fly-wheel,

a line to the North River, and intersect all transportation lines running north and south in Manhattan.

Referring to the Brooklyn Bridge, the Commissioner says that delays have been very few in the traffic, and those chiefly due to heavy snowstorms in February and March. He does not estimate the number of people carried across the bridge in one day, but quotes figures of the Brooklyn Rapid Transit Company for a day of twenty-four hours, in which 295,058 passengers were carried on the trolley cars. This is an increase, he says, of 11,994 passengers over the previous count made last fall. Referring to plans for temporary relief, Mr. Lindenthal says:

"A number of plans have been providing for increased traffic facilities in the Manhattan terminal of the bridge, the most feasible and least expensive being a plan for four additional loop tracks on the lower floor or the terminal for the use of the surface cars until plans for permanent improvement can be carried out; but before such tracks can be built it will be necessary to extend the tail-switching tracks of the bridge railway across Center Street and lengthen out the platforms in order to obtain the approaches and stairways required to replace those which will have to be removed



when the new loops are built. Conflicting interests and circumstances have thus far delayed this improvement.

"These proposed temporary expedients have no relation to the permanent terminal improvements, and should be made on a comprehensive scale for all future needs, and should include the other bridges over the East River now under construction."

The Commissioner then refers to the two plans for relief, one of which was devised by the three experts under the McCarren act, and the other by Chief Engineer Martin, of the Brooklyn Bridge. The Commissioner says further:

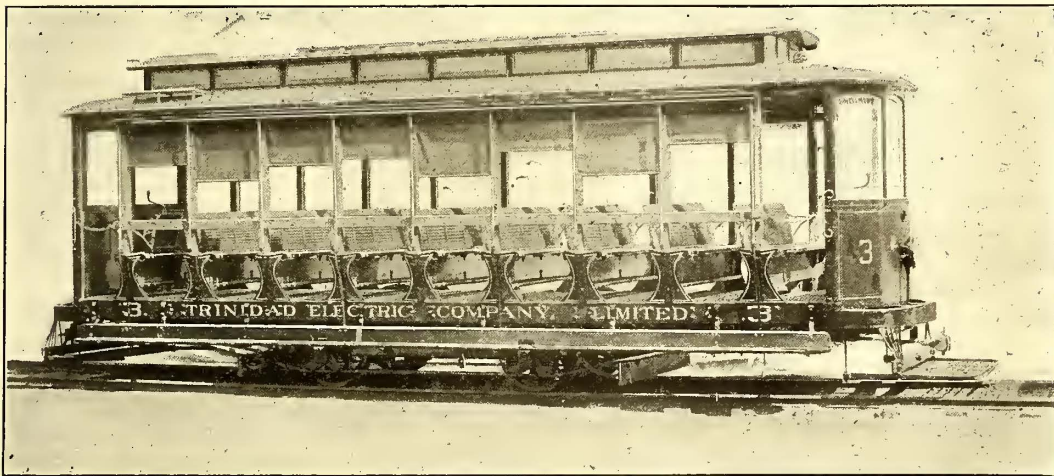
"There is good reason for the belief that through the co-operation of the Bridge Department with the Rapid Transit Board a final, adequate and permanent solution will be found for the bridge terminal question."

### Cincinnati Franchises Declared Invalid

The Superior Court, Judge Dempsey, Judge Smith and Judge Ferris concurring, has declared unconstitutional the Rogers law, which granted the Cincinnati Street Railway Company an extension of its franchise for fifty years, expiring in 1946. If the Supreme Court sustains the Superior Court, franchises granted elsewhere under the same law will be invalid. The court held that the Rogers law arbitrarily classifies street railways and municipalities and that it is not uniform. The law gave a fifty years' extension of franchise only for such street railways as complied with various conditions on the day it went into operation. It is generally believed that the decision will be reversed when taken before the Supreme Court.

### Open Cars for the West Indies

The Island of Trinidad, off the coast of Venezuela, has paved so many of our streets with its famous asphalt that it is only fair that America should contribute something in return. This has been done in the shape of fifteen new cars, built by the J. G. Brill Company, and lately placed in commission on the fine streets of the handsome tropical capital—Port of Spain. The cars were ordered by the Trinidad Electric Company, Ltd. Aside from their fine con-



OPEN CARS FOR TRINIDAD

struction and appearance, are interesting from the fact that they depart from the usual bulkhead construction.

The cars are 30 ft. long over all; the width over the sill plates is 6 ft. 3 ins.; width over the posts is 7 ft. 2 ins., and over all 7 ft. 8 ins. The vestibule ends are steel sheathed, and have pockets for the windows. The cars are equipped with "Dedenda" gongs, round-corner seat-end panels, radical draw bars, angle iron bumpers, ratchet brake handles, etc. The trucks are of the Brill 21-E pattern.

### New York Street Railway Convention

This convention, as has already been announced, will take place Sept. 9-10, at the Fort William Henry Hotel, Caldwell, and an interesting programme has been arranged.

The committee on rules, which was appointed two years ago, and which made its first annual report at the last meeting, has devoted considerable time to the formation of a second annual report, which will embody the suggestions made at last year's convention,

and the best thought of the railroad managers of this State upon the subject during the past year.

The question of the "Economic Use of Power by Motormen" has been assigned to several individuals, and will be taken up as a subject of discussion.

The following papers are also announced:

"Power House Accounting," by R. E. Danforth, of the Rochester Railway Company.

"Supply House Methods," by A. C. Tully, Metropolitan Street Railway Company.

"Accidents," by Charles R. Barnes, inspector of the Board of Railroad Commissioners. At the close of Mr. Barnes's paper this subject will be discussed by W. W. Cole, of Elmira, and Hon. Joseph F. Daly, of New York.

"The Effect of Interurban Service on Small Towns," Colonel N. H. Heft.

"The Removal of Snow and Ice," by W. Boardmann Reed, of the Metropolitan Street Railway Company, of New York.

"Discipline," by C. B. Fairchild.

The Trunk Line Association has granted a rate of fare and a third on the certificate plan to all delegates attending the convention, and the Fort William Henry Hotel has granted a special rate to all delegates.

A special invitation has been extended to both supply men and ladies by the local committee, and it is hoped there will be a large attendance of both. A ladies' reception committee has been appointed, and a reception to the ladies will be held upon the first morning of the convention.

Large accommodations have also been made for an exhibit of street railway supplies for those who wish to take advantage of making an exhibit. The exhibits will be in accommodations adjoining the convention hall, and some person will be in attendance at the Fort William Henry Hotel on Monday morning, Sept. 8, to attend to the wants of the supply men.

### The Mersey River Tunnel

The last of the main generators and engines intended to be installed in the power plant of the Mersey Tunnel Railway, Liverpool, are about to be shipped from the Westinghouse Works at East Pittsburgh. These generators are of the railway type (1200 kw, 650 volts, 90 r. p. m.), and are to be direct connected to vertical cross-compound Westinghouse-Corliss engines of 1500 hp each. The power house lighting and the electric light of all stations, sidings, etc., will be supplied from a separate generating plant, comprising two compound-wound generators, each having a capacity of 200 kw at 650 volts, direct connected to Westinghouse compound engines, and running at a speed of 250 r. p. m. The power generating plant will have an aggregate output of about 6600 hp—6000 hp for the railway

proper and 600 hp for lighting. The Westinghouse electropneumatic system of train control is to be used, and the cars will be equipped with Westinghouse high-speed air brakes. The rolling stock will consist of sixty cars, each about 60 ft. in length. The trains will be formed of five cars each, the first and last cars of a train being motor cars, equipped with four 100-hp motors each.

The Mersey Railway connects Liverpool and Birkenhead, and passes under the river Mersey. The tunnel is double tracked. The route of the railway is about 4½ miles long, the total length of track, including sidings, being about 12 miles long. Its situation is unique, joining two such important business cities, between which the only competition in the transportation of passengers and freight is given by ferry boats on the river, and the traffic on the line is large. The number of passengers carried amounted to between seven and eight millions per year, even with the old steam locomotive system.

The railway is standard gage, laid in accordance with heavy steam railway practice, the rails being of the ordinary English "bul' head" type, weighing 86 lbs. per yard. The line is to be fitted with the third rail system, the conductor rail to be laid alongside and just

outside of the running track. The running rails will not be used as the return electrical conductor, but a fourth rail is to be placed between them solely for this purpose. The third and fourth rails will be similar in size and in arrangement. They are to be of T-section, 60 ft. in length, and to weigh 100 lbs. per yard. They will be effectively bonded and carried on stoneware insulators, spaced at intervals of 7 ft. or 8 ft. apart.

It is expected that trains will run on a three-minute service. The tunnel and the seven stations of the system are to be electrically lighted throughout. The power generating station, the machinery and the track work are all being pushed rapidly to completion.

### Electric Traction in Russia

According to Thomas E. Heenan, United States consul at Odessa, electricity is coming into use for tramways in Russia. The first electric tramway built in Russia was the one at Kiev, which dates from 1893. In 1898 forty-five cities had constructed such lines. Their length exceeded 312 miles. The number of motor cars was about 300 and there were many trail cars. The total length of wire for the electric tramways in St. Petersburg is estimated at 1875 miles. Overhead and underground conductors will be used, and, on the principal streets, the accumulator system will be adopted. Nearly 400 motor cars will be in use, and there will be 300 trail cars. Other cities also contemplate the employment of electricity on a large scale, and plans are under consideration for its use on the great railroads of Russia. These projects include the construction of an electric railroad to connect neighboring towns on the western frontier of Russia, and the establishment of a road to cross the Caucasus Mountains, between the town of Sukhum and one of the stations of the Vladikavkas Railway. To supply power for this latter road it is proposed to harness the mountain streams.

In regard to extending trade in Russia, Mr. Heenan says:

"It will thus be seen that the demand for electrical apparatus and machinery in Russia is relatively but little satisfied by the home manufacturers, and the progress in the application of electricity for transportation, manufacturing, and domestic economy will undoubtedly enormously increase the market for foreign appliances. American manufacturers should have their share of this trade, and there is but one way to secure it—that is, to establish branch houses in this country and place the same in the hands of competent men. The Germans hold the field in supplying this country with electric appliances, because they are ever present and always patient; they study their customers, ascertain their financial condition, give long credit with reasonable interest, and employ men who are either German-speaking Russians or Germans born in Russia, who, of course, speak both Russian and German."

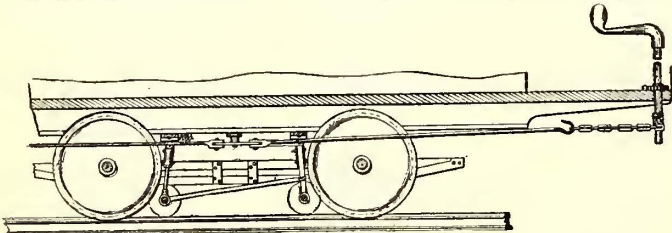
It will require more than a casual visit to Russia on the part of American business men, Mr. Heenan says, if they are to win their proper share of the future business to be done in electrical appliances, and he says that it is not too much to say that in no other branch of trade is there likely to be such material progress in Russia.

### Street Railway Patents

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

UNITED STATES PATENTS ISSUED AUG. 19, 1902.

707,120. Car Wheel; G. Killian, Scranton, Pa. App. filed Aug. 30, 1901. Relates to a built-up car wheel, and comprises



PATENT NO. 707,331

two disc body portions and a tire which covers the periphery of both discs.

707,149. Brake; A. R. Moore, Charlotte, Mich. App. filed March 19, 1902. Details of a braking mechanism.

707,208. Side and Center Bearing for Car Trucks; E. Cliff, Newark, N. J. App. filed July 2, 1902. The bearing comprises upper and lower members having at each side of a vertical trans-

verse line oppositely inclined track surfaces between which rollers are located, there being means whereby the rollers are kept a definite distance apart.

707,255. Safety Ball for Tram Protecting Rollers; E. Raus, Prague, Austria-Hungary. App. filed April 30, 1902. A fender consisting of a rotating cylinder or cylinders which are covered with elastic balls or fingers.

707,331. Car Brake; W. House, Syracuse, N. Y. App. filed Jan. 16, 1902. Relates to mechanism in which the braking action is obtained by means of rollers forced into frictional contact with the threads of the car wheels and track rails adjacent thereto, which contacts subject the rollers to strains reverse from the rotation of the car wheels.

707,465. Emergency Brake; C. Vogel, Newburg, N. Y. App. filed March 7, 1902. A device having a beak which is adapted to be forced into the surface of the roadbed when it is desired to stop the car.

### PERSONAL MENTION

MR. F. M'KENNA, at present road master of the Toronto Street Railway Company, of Toronto, Canada, has been appointed inspector of the company, a newly-created position.

VICE-PRESIDENT C. S. SERGEANT and Chief Engineer of Elevated Lines George A. Kimball, of the Boston Elevated Railway Company, recently sailed for an extended European trip of combined business and pleasure.

MR. F. B. LENEGAN, formerly superintendent of the San Francisco & San Mateo Electric Railway and the Haywards-Oakland Electric Railway, of California, has been appointed superintendent of the Los Angeles Traction Company, of Los Angeles, Cal.

MR. ERNEST W. CARPENTER, who has been in the employ of the Port Chester Street Railway for many years, has recently been appointed assistant superintendent of the New York & Stamford Railway Company, which now controls the Port Chester Street Railway.

MR. W. F. D. CRANE, who has been associated with Sander-son & Porter, 31 Nassau Street, in an engineering capacity, has recently joined the forces of the American Stoker Company, 277 Broadway, New York, as manager of its contract department. Mr. Crane will have his quarters in the New York office of the company.

MR. P. E. GARRISON, master mechanic of the Fonda, Johnstown & Gloversville Railroad, of Gloversville, N. Y., died suddenly in his office in Gloversville a few days ago. Mr. Garrison was formerly connected with the Erie & Central Railroad, and was master mechanic of the Western division of the West Shore Railroad for a number of years.

MR. CHARLES F. WALLACE, of the operating and engineering departments, and Mr. Karl A. Ancien, purchasing agent, of Messrs. Stone & Webster, of Boston, have just returned from an extended trip through the South, West and Middle States, in which a number of the firm's properties were visited, including El Paso, Tex.; Seattle, Wash.; Minneapolis and others.

MR. EDWARD BIRD EDWARDS, who for almost half a century was identified with street railroad enterprises in Philadelphia, died a few days ago at the home of his daughter in East Moorestown, N. J., where he had been visiting. Mr. Edwards was born in Philadelphia in 1822 and after attending Haverford College, entered into business as a flour and feed merchant and later became a lumber dealer. He invested largely in street railway interests and was made president of the Ridge Avenue Passenger Railway Company, of Philadelphia, holding, in addition to this, the presidency of the Board of Street Railway Presidents. It was through Mr. Edwards that 5-cent fares were established in Philadelphia, the Ridge Avenue line being the first to abolish the 6-cent rate.

MR. THOMAS NEVINS, of East Orange, N. J., died at his residence, Mount Shannon, Castle Connell, County Limerick, Ireland, on Aug. 21. Mr. Nevins was a man of wealth and a large shareholder in many electric traction companies in the United States. He was also connected with railroad and gas enterprises in New Jersey. In England Mr. Nevins had engaged to construct under the name of the South Lancashire Electric Traction Company, a number of interurban electric lines between and around Liverpool and Manchester. Mr. Nevins was born at Kells, County Mayo, Ireland, May 30, 1844. He came to the United States in 1864, settled in Orange and embarked in the contracting business. His early work was in connection with the macadamizing of streets and roads. He afterward secured a blue stone quarry, which laid the foundation of his later wealth. He became interested in the development of electric railways, and at one time was largely interested in the street railroads of Detroit, Mich.

## LEGAL DEPARTMENT

CONDUCTED BY WILBUR LARREMORE OF THE NEW YORK BAR

### Sensational Exhibits and Episodes in Accident Cases

In *Rost vs. R. R. Company* (10 N. Y. App. Div., 478), it was laid down that in an action for damages for personal injuries caused by the alleged negligence of the defendant, it may be proper to exhibit the injured bodily member to the jury, if such exhibition be necessary to enable the jury better to understand the character of the injury, or the conditions which existed when it was received. It was, however, held that where the legitimate purposes of the exhibition are necessarily slight, and the evident tendency of it is to work improper and illegitimate results, the rule does not apply. It was therefore decided that the exhibition of a child's foot, which had been amputated and preserved in a glass jar, was error which called for a new trial.

In *Perry vs. Met. St. Ry. Co.* (68 N. Y. App. Div., 351), it was held that a plaintiff in an action to recover damages, who alleges that several of his ribs were fractured, that he had been injured about the body and internally, and that the injuries are permanent, may properly be allowed to exhibit his bared body to the jury, and to have pointed out thereon the physical signs of the injuries, where the defendant announces its intention of disputing the question whether the plaintiff's injuries were as serious as he claimed them to be. The distinction between these two cases is one of simple common sense and justice. If a defendant does not controvert the nature and extent of injuries, through a street railway accident or other cause, there can be no practical necessity for introducing the injured or dismembered portions of a human body in evidence. If there be no such probative necessity the exhibition will almost inevitably tend toward placing the jury in an unjudicial frame of mind; toward influencing them to increase a verdict for an injured person through mere horror and physical repulsion.

In connection with those cases there may be instanced two others that came before the Appellate Division of the Supreme Court of the State of New York, *Corley vs. N. Y. & H. R. R. Co.* (12 App. Div., 409) and *McGloin vs. Met. St. Ry. Co.* (71 App. Div., 72). In neither of them was a formal introduction in evidence of physical abnormality relied on as error. In the *Corley* case, however, it presumptively appeared that the plaintiff had, by an elaborate display of fictitious infirmity, feigned very serious injury which did not exist. In the *McGloin* case it appeared that on the first day of a trial for personal injuries, after adjournment, and in the presence of one or more of the jurors, the plaintiff became prostrated in the court room and was attended by physicians and after about twenty minutes was removed from the room. There was evidence that his physical condition at the trial was the result of the injuries alleged. It was not alleged that the attack was simulated or that symptoms were intentionally manifested before the jury, and the court asked any of the jury so affected by the event that they could not decide the case as if it had not occurred to rise, but no one arose, and a juror who saw the occurrence stated that it would not affect his decision.

In the *McGloin* case it was very properly and justly held that the refusal of the trial court to grant a new trial would not be disturbed. In the *Corley* case the Appellate Division, fully as properly and justly, went to very considerable lengths in order to grant a new trial.

Under the present condition of "accident litigation" the policy of discretionary reversal in proper cases is certainly not to be discouraged. The action of the Appellate Division of the New York Supreme Court in the four cases above cited certainly tends to show that it will endeavor, upon some available legal theory, to do substantial justice with regard to veritable claims, as well as fictitious and fraudulent claims, and the policy pursued by that tribunal may well be adopted as a model elsewhere.

### LIABILITY FOR NEGLIGENCE.

#### GEORGIA.—Second Appeal—Law of the Case.

A judgment denying an interlocutory injunction, when the same depends entirely upon questions of law, is, upon its affirmance by the Supreme Court, conclusive against the plaintiff in error as to every such question made by his assignments of error, though there be no express reference to all of them either in the opinion filed, or in the synopsis of the points decided.—(*Savannah, T. & I. H. Ry. Co. vs. Mayor, etc., of City of Savannah*, 41 S. E. Rep., 592.)

NOTE.—Communications relating to this department should be addressed to Mr. Larremore, 32 Nassau Street, New York City.

ILLINOIS.—Carriers—Street Railways—Injury to Passenger—Complaint—Amendment—New Cause of Action—Allegations—Evidence—Special Damages—Elements of Damage—Unskillful Medical Treatment—Instructions—Remarks of Court—Harmless Error.

1. Where, in an action against a street railroad and another for injuries, the complaint alleged that the servants of the railroad so carelessly managed the car in which plaintiff was seated and the other so carelessly managed a truck he was driving that the car and truck collided, and injured plaintiff, a contention that an amendment, after the time limited for bringing an action for the injuries, to the effect that plaintiff was in the exercise of ordinary care for her safety, was a statement of a new cause of action, so that the bar of limitations might be interposed, was without merit.

2. *Hurd's Rev. St.* 1899, p. 1287, enacts that the adjudication of the court allowing an amendment shall be conclusive evidence of the identity of the action. Held, that a contention that an objection to an amendment as the statement of a new cause of action barred by limitations could not be taken by plea, but should be taken by exception, because the allowance was conclusive, was of no merit; limitations being a privilege which must be pleaded to be availed of, and a count on a new cause of action being good unless the defense of limitations is interposed.

3. Where, in an action for injuries, the complaint alleged that plaintiff sustained serious physical injuries, causing great pain and suffering and impairment of bodily health, strength, and ability to labor, evidence of a miscarriage seven months after the accident was admissible.

4. In an action for injuries, counsel for defendant had been inquiring about plaintiff's testimony as to her health before the accident. His questions had been fully answered, and plaintiff had stated she had not had a doctor, but had sometimes taken a little medicine in the spring. The court then said, in effect, that he should have to interpose an objection if counsel were going to consume time with immaterial matter; that she might as well be asked if she did not get up in the morning during the several years; that thousands of people took medicine in the spring, and it did not prove her health bad. Held, that the remarks were improper.

5. The remarks were not prejudicial.

6. It did not appear that the cross-examination was improperly abridged.

7. In an action for injuries, an instruction that, if plaintiff exercised ordinary care in seeking medical aid, she might recover for all physical impairments, though they resulted "in whole" from mistakes of medical attendants, was improper.

8. The error was harmless, it appearing from the evidence that her impairments were not wholly due to mistakes in treatment.

9. Where mistakes are made in the treatment of one injured, who has used ordinary care in the selection of medical attendants, injuries from such mistakes are a part of the damages resulting from the original injury.—(*Chicago City Ry. Co. vs. Cooney*, 63 N. E. Rep., 1029.)

ILLINOIS.—Street Railroads—Action for Injuries—Child on Track—Evidence—Sufficiency—Admissibility—Credibility of Witnesses—Previous Contradictory Statements—Jury Questions—Contributory Negligence—Capacity of Child Under Seven—Negligence of Parent—Imputation—Instructions.

1. Plaintiff's evidence tended to show that, when he, a six-year-old boy, was run over by defendant's electric street car, he was standing on defendant's track, about 20 ft. from a street crossing, with his back toward the approaching car, and talking to a boy standing on the sidewalk; that the car was running about 16 miles an hour; that no bell was sounded for the crossing, and that, when the boy on the sidewalk saw it, he warned plaintiff, who attempted to get off the track, but too late, the car being only 15 ft. away; that plaintiff was standing in full view of the motor-man; and that, when the car stopped after running over him, it had passed him 75 ft. Defendant's evidence tended to contradict plaintiff's on all material points, and there was evidence of previous contradictory statements by plaintiff's principal witnesses. Held, that the evidence was sufficient to justify the submission of the case to the jury.

2. The fact that a street car runs an unusual distance before it is stopped, after running over a person, is some evidence of improper management thereof.

3. Where, in an action against a street railway company for injuries, defendant introduced evidence, based upon notes taken in an interview with plaintiff's witnesses immediately after the accident, and on a subsequent interview between such witnesses and defendant's attorneys, which was taken down by a stenographer, tending to contradict the testimony of the witnesses at the trial, whether the witnesses were in fact contradicted was for the jury.

4. In an action against a street railway company for injury to a child of tender years, it appeared that he had been going for several months to a school two blocks from his house, to reach which he had to cross defendant's tracks, which ran by the school; but it did not affirmatively appear that he went to school alone, and his mother testified that she never allowed him to go alone to visit his playmates, only a block and a half away. Held, that the evidence was insufficient to show that the child was of sufficient intelligence or capacity to exercise any care for his own safety, especially in view of the presumption that defendant obeyed the law and exercised greater care at the crossings frequented by school children than at the ordinary crossing, where the child was injured.

5. A child under seven years of age is incapable of such conduct as will constitute contributory negligence.

6. The giving of an instruction which states the law incorrectly is not reversible error, where it appears that under the evidence the jury could not have found otherwise than in accordance with the effect of the instruction.

7. Where an instruction, in an action against a street railway company for injury to a pedestrian, that defendant, in using the highway, was bound to use "every reasonable effort to avoid injury to others," was qualified by other instructions that defendant was not bound to use the highest degree of care, but only ordinary care under the circumstances of the case, and possible error in the first instruction was cured by the others.

8. In an action against a street railway company for injuries, the court instructed that in considering the credibility of witnesses, and in determining the worth of their testimony, the jury might consider the fact that a witness was in defendant's employ, and also his connection, if any, with the accident complained of. Other instructions stated that defendant's employees were competent witnesses, and that their testimony could not be arbitrarily rejected because they were such employees, and that, if the jury believed that any witness was interested in the result of the suit, they might consider such interest, together with all the other circumstances which would aid them in determining the credit to be given such witness. Held, that any possible defect in the first instruction was cured by the others.

9. In an action against a street railway company for injury to a six-year-old boy, which was tried four years after the accident, plaintiff testified that he did not remember how he was hurt, whereupon defendant introduced evidence of previous statements made by him to his playmates as to the manner in which he was injured. Held, that there was no error in instructing that the admissions of a child of plaintiff's age when his admissions were made should be received more cautiously than those of an adult, and should be weighed with reference to his age and understanding.

10. The negligence of the parent of a child six years old in allowing him to go across street car tracks with a boy eleven years old was not imputable to the child, so as to support the defense of contributory negligence to his action for injuries received through the negligence of the railway company.—(Chicago City Ry. Co. vs. Tuohy, 63 N. E. Rep., 997.)

KENTUCKY.—Unrecorded Mortgage—Purchaser Without Notice—Waiver of Lien by Acceptance of Personal Security—Property Added to Street Railroad Covered by Prior Mortgage on Road.

1. The lien of an unrecorded mortgage is inferior to the lien subsequently acquired by a mortgagee who gave credit without notice of such prior lien.

2. A seller who had a lien for the purchase price on property sold to a corporation waived his lien by accepting in satisfaction of his claim the notes of the corporation indorsed by the individual stockholders.

3. Property added to the plant of a street railroad company, and which becomes an essential and integral part of its road, passes under a mortgage previously executed and recorded, conveying its entire road, constructed and to be constructed, though the property thus added was furnished under a contract stipulating that the title was to remain in the seller until payment made.—(Westinghouse Electric Mfg. Co. vs. Citizens' St. Ry. Co. et al., 68 S. W. Rep., 463.)

KENTUCKY.—Carriers—Street Railroads—Care Due Passengers—Contributory Negligence—Panic Among Passengers—Proximate Cause—Instruction as to Burden of Proof.

1. The duty of a street railroad company to a passenger to protect her from injuries from its appliances is not fulfilled by recent inspection of its cars, or by an inspection by a competent employee, but the law requires of it "the utmost care and skill which prudent men are accustomed to use under similar circumstances."

2. It was error to instruct the jury that it was the duty of plaintiff, when going upon defendant's cars, "to exercise due care and caution, use her eyes, and act with reasonable care and judgment for her own safety, more especially if she found the car unusually overcrowded with passengers," but the court should instead have instructed the jury that it was incumbent on plaintiff while on the car "to exercise such care and caution as might be reasonably expected of a person of ordinary prudence situated as she was."

3. If the negligence of defendant produced a flash of fire, followed by smoke in the car, causing a panic among the passengers, whereby plaintiff was injured, that negligence was the proximate cause of the injury, provided the conduct of the passengers was such as might reasonably be expected under similar circumstances, considering the crowded condition of the car and the fact that it was moved by electricity.

4. A passenger makes out a prima facie case against the carrier when he shows an injury resulting from a defect in any of those things the carrier is bound to supply.

5. It is safer to so frame instructions as to indicate the burden of proof without expressly referring to it, and therefore the court should have instructed the jury that, if plaintiff's injury was due to any defect in the car or cars on which she was riding, or the machinery or appliances connected therewith, and she did not, by her own want of ordinary care, contribute to the injury, they should find for her the damages she thereby sustained, unless they believed from the evidence defendant had exercised the utmost care and skill which prudent men are accustomed to use under similar circumstances to ascertain any defects in the car and appliances and secure their safety.

6. When specific facts are alleged constituting contributory negligence, the instructions should be confined to those facts.—(Davis vs. Paducah Ry. & Light Co., 68 S. W. Rep., 140.)

LOUISIANA.—Street Railroads—Injury to Person on Track.

Where a boy of 13 walks from one side of a street, on which there are double car tracks, toward the other side, at night, and, without stopping, collides with a car, blazing with light, loaded with passengers, and moving at the rate of six miles per hour, which there was nothing to prevent his seeing and hearing, there can be no recovery for injury resulting from such collision.—(Kaiser vs. New Orleans & C. R. Co., 32 Southern Rep., 75.)

MASSACHUSETTS.—Carrier—Street Cars—Ring in Floor—Injury to Passenger—Negligence of Company—Evidence—Admissibility.

1. Evidence is admissible in an action against a street railway company by a passenger injured by catching her foot in a ring in the floor of the car that the ring was standing erect immediately after the accident, and, on being pushed down, would rise and remain upright on the starting of the car, as such evidence tends to show that the ring was in such condition and operated in such manner when the car left the barn, some time before, which would charge the company with notice of the defect, or show negligence on the part of the conductor in failing to discover its condition.

2. Where the testimony of a witness on cross-examination is inconsistent with his testimony in chief, his testimony should not be stricken out, but should be submitted to the jury, with instructions that it is inconsistent with itself.

3. A street car company is negligent in allowing a ring in the floor of its car to get into and remain in such a condition that it rises when the car starts, and remains standing unless replaced, even though the builder of the car is reputable, and the ring is a usual device.—(Kingman vs. Lynn & B. R. Co., 64 N. E. Rep., 79.)

MICHIGAN.—Street Railroads—Action for Injuries—Persons on Track—Contributory Negligence.

In an action against an electric railroad company for injuries to a pedestrian it appeared that, after one of defendant's regular passenger cars passed him, plaintiff walked in the same direction about 200 ft., and went upon defendant's track, and continued his way for 200 ft. further, when he was struck by a gravel train approaching from behind. Plaintiff did not look back after the passenger car passed, but the motorman testified that he saw plaintiff when within about 200 ft. of him, and that he at once rang the gong, and tried to stop. The evidence as to whether the gong was sounded and as to the distance the car ran after striking plaintiff was conflicting. Held, that the question whether the accident was due to plaintiff's contributory negligence was for the jury.—(Quirk vs. Rapid Ry., 90 N. W. Rep., 673.)

MISSOURI.—Contracts — Fraud — Action — Equity — Jurisdiction—Parol Evidence—Trial—Non-suit.

1. Plaintiff was injured by collision with a street car, and brought action at law against the company on its failure to perform an alleged agreement by which it was to furnish a physician to treat and cure plaintiff's broken leg so as to make it well and sound, so that plaintiff could walk and perform manual labor. Defendant produced a written agreement, signed by plaintiff, by which defendant merely agreed to pay plaintiff's expenses, doctor and board bills, until he was able to get home. Held, that plaintiff was not entitled to show that he signed the agreement under a mistake as to its contents, produced by misrepresentations made to him by the agents of the railroad company when he was too weak to read, with the dishonest intention of securing his signature to an agreement different from the one agreed to verbally; as the fraud which renders a contract void at law relates to the execution, and not misrepresentations as to the subject matter.

2. The evidence was not admissible under Rev. St. 1899, Sec. 654, providing that, when a release or settlement is pleaded in bar of plaintiff's action, plaintiff may show fraud in its procurement; as plaintiff's action was not founded on the injury from the collision.

3. Plaintiff, who had been injured by collision with a car, sued the railroad company for failure to fulfil an alleged agreement to furnish him a physician who would treat and cure his leg until he could walk and perform manual labor, and defendant produced a written agreement, signed by plaintiff, by which defendant had merely agreed to furnish a physician, and, on refusal to permit plaintiff to show that such writing was procured by certain misrepresentations as to its contents, he suffered a non-suit. Held that in view of the voluntary non-suit, plaintiff could not urge that, as there was evidence that defendant actually furnished a physician, who treated plaintiff carelessly, he was entitled to go to the jury on the question of an implied undertaking to furnish proper treatment.—(Koffman vs. Southwest Missouri Electric Ry. Co., 68 S. W. Rep., 212.)

MISSOURI—Carriers of Passengers—Personal Injuries—Amount of Damages—Former Verdict.

1. Where, in an action against a street railway for personal injuries, plaintiff's evidence tended to show that her right arm was broken, her spine and nose injured, her ankle sprained, and her injuries permanent, and it appeared that a former jury had awarded her \$2500, the court will not interfere with a second verdict for substantially the same amount.

2. Where, in an action for personal injuries, defendant introduced a witness who testified that he had dressed plaintiff's arm the night of the accident, and had waited on her from four to six weeks afterwards, refusal to allow him to testify as to the nature of the injury was not reversible error, in the absence of any statement of the object of the testimony, so as to enable the court to determine its materiality.—(Loker vs. Southwestern Missouri Electric Ry. Co., 68 S. W. Rep., 373.)

NEW YORK—Street Railroads—Failure to Stop—Boarding Moving Car—Instructions.

Where plaintiff was injured by the premature starting of a street car, which he had attempted to board while it was moving "at a snail's pace," on instruction, in an action for his injuries, that the usual invitation to board a public vehicle is that it stops, and, in all ordinary cases, to get aboard a moving public vehicle is imprudent, was erroneous, as applying to street railroads the law applicable to steam railroads; it not being contributory negligence per se for a person to board a moving street car.—(Lobsenz vs. Metropolitan St. Ry. Co., 76 N. Y. Supp., 411.)

NEW YORK—Privileged Communications—Statements to Physician.

Where a physician acquired his information as to how an accident happened from the injured party while attending him as a surgeon, he is not rendered incompetent to testify thereto by Code Civ. Proc., Sec. 834, unless the information was "necessary to enable him to act in that capacity;" and, in the absence of evidence of that fact, exclusion of such evidence on the ground that it was privileged was error.—(Green vs. Metropolitan St. Ry. Co., 63 N. E. Rep., 958.)

NEW YORK—Street Car—Injury to Passenger—Instructions.

In an action to recover for injuries received in attempting to board a street car, an instruction that, if the jury believed the evidence of the witnesses for plaintiff, the act of the conductor in starting the car was negligent, and constituted a cause of action in favor of plaintiff against defendant, was reversible error, because submitting only the question of the credibility of plaintiff's witnesses, and withdrawing the question of defendant's negligence and of plaintiff's contributory negligence, both of which questions should have been submitted, even though the evidence of plaintiff's

witnesses was believed.—(Kellegher vs. Forty-Second St. M. & St. N. Ave. R. Co., 63 N. E. Rep., 1096.)

NEW YORK—Appeal—Review—Sufficiency of Evidence—Collision with Street Car—Remote and Proximate Cause—Negligence of Driver

1. On appeal from a judgment entered on a verdict unanimously affirmed by the appellate division, the sufficiency of the evidence cannot be considered, but only questions raised by the exceptions to the instructions or refusal to charge as requested.

2. Plaintiff's decedent drove in front of an electric car approaching from six to nine miles an hour, and was fatally injured. The wagon was carried some distance along the track before it was overturned. Held that the motorman did not act willfully or carelessly, since the act of the driver and the conduct of the motorman were so substantially concurrent that it would be impossible to separate the conduct of the injured person from the injury itself, so that the doctrine that the remote negligent act of the injured party would not bar recovery is not applicable.

3. The same test must be applied to the conduct of both parties in determining whether the cause of an action is proximate or remote.

Where a driver negligently drove on the track of a rapidly approaching electric car, the accident may properly be attributed to his negligence, though the vehicle was carried some distance along the track before it was overturned and the injuries inflicted.

5. Where a driver attempts to cross the track of an electric railway diagonally when an approaching car is so near as to render attempt dangerous, the rule that a railway car may not run into a person though he is on the track through his own negligence is not applicable.—(Rider vs. Syracuse Rapid Transit Ry. Co., 63 N. E. Rep., 836.)

NEW YORK—Privileged Communications—Testimony of Physician.

The burden rests on plaintiff in an action to recover for personal injuries to show, when he seeks to exclude the testimony of a physician under Code Civ. Proc., Sec. 834, prohibiting a physician from disclosing any information acquired while attending a patient in a professional character, necessary to enable him to act as a physician, to show that the relation existed; and where there is no evidence of that fact, or that the testimony had any relation to professional treatment, it is improperly excluded.—(Griffiths vs. Metropolitan St. Ry. Co., 63 N. E. Rep., 808.)

#### CHARTERS, FRANCHISES AND ORDINANCES.

ILLINOIS—Eminent Domain—Supplementary Proceedings—Collateral Attack—Statutes.

1. Where a judgment of condemnation has been entered it cannot be objected, on collateral attack, in a supplementary petition to pay the judgment, that the condemnation was not within the power of the city because only a part of the land for the condemnation of which the ordinance provided was actually proceeded against.

2. There is jurisdiction to render a condemnation judgment, though only a part of the lands for the condemnation of which the ordinance provided is proceeded against.

3. City and Village Act 1872, Sec. 53, providing for supplementary proceedings to pay condemnation judgments, enacts that every such cause shall be considered as pending in the court where commenced until all the lands sought to be taken are paid for, or until the proceedings are dismissed where the lands are not taken. Laws 1897, relative to condemnation, enacted that proceedings pending when the act took effect should be governed by the laws under which they were commenced. A condemnation judgment was entered as to part of the land provided for in the ordinance, prior to the act of 1897, and, subsequent to the taking effect of such act, proceedings as to the balance of the lands were dismissed. Held, that supplementary proceedings to pay the judgment, commenced prior to the dismissal, were not governed by the act of 1897.

4. The question whether part of the land embraced in a condemnation judgment was public property cannot be litigated in supplementary proceedings to pay the judgment.

5. Property assessed to a railroad company for a special assessment was described as "right of way, right of occupancy, franchise, and interest of the South Chicago City Railway Company in and upon Ontario Avenue from Seventy-Ninth Street to Eighty-Third Street." Held, that the description was sufficient.—(South Chicago City Ry. Co. et al vs. City of Chicago, 63 N. E. Rep., 1046.)

INDIANA—Street Railroads—Franchises—Contract—Constitutional Law—Special Privileges—Carriers—Ejection of Passengers—Evidence—Presumptions.

1. Where the complaint in an action against a street railroad company, in a city of over 100,000 population, for the ejection of

a passenger for the non-payment of fare, does not allege that the company was not acting under a contract with the city, made in pursuance of 2 Burns' Rev. St. 1901, Sec. 5458c et seq., authorizing and relating to such contracts, which would authorize the charge of an increased fare, it will be presumed that the requirement of the conductor as to the payment of the increased fare was lawful.

2. Acts 1899, p. 260 (2 Burns' Rev. St. 1901, Sec. 5458c et seq.), authorizes cities of over 100,000 to contract with an existing or future street railroad corporation, and to grant such corporation a franchise not exceeding thirty-four years; one of the conditions of such contract being the company's surrender of all franchises or rights to use the streets. Section 8 provides that, if no extension of the franchise of existing street railroad corporations is granted between the enactment of the statute and nine months of the expiration of the franchise, the company may remove its tracks, but that the Board of Public Works shall open to free competition the right to so occupy the streets not less than nine months before the expiration of such franchise, and authorizes the successful bidder, if not the former occupant of the streets, to condemn the property. Section 9 provides that the contractual powers of the Board of Public Works with reference to the use of streets are not taken away by the statute, except by contracts under it. Section 10 requires companies operating under the statute to charge certain fixed rates, which are higher than those fixed by former statutes. Two Burns' Rev. St. 1901, Sec. 3830, gives the Indianapolis Board of Public Works power to grant franchises to street railroads for such terms and on such conditions as it sees fit. Held, that the act of 1899 is not a grant of a right to an existing Indianapolis street railway company, denied to others, by which it may charge a higher fare than other companies, in violation of Const. Art. 1, Sec. 23, prohibiting the granting of special privileges or immunities, as the benefits of the act are not confined to existing corporations.

3. The statute is not in violation of Const. Art. 11, Sec. 13, requiring corporations other than banking corporations to be formed under general laws, as it does not relate to the creation of corporations, but to the granting of franchises.

4. It will be presumed, in an action against a street railroad corporation, that it was incorporated under Rev. St. 1881, Sec. 4143 et seq., constituting a general law for the incorporation of such companies.

5. Acts 1899, p. 260 (2 Burns' Rev. St. 1901, Sec. 5458c et seq.), relating to the granting of franchises to street railroad companies in cities of over 100,000, is not a local or special law, where a general law may be made applicable, in violation of Const. Art. 4, Sec. 22, requiring general laws in all cases where they are applicable, as the determination of the Legislature that a general law is not applicable cannot be reviewed.—(Smith vs. Indianapolis St. Ry. Co., 63 N. E. Rep., 849.)

MICHIGAN—Municipal Corporations—Water Works—Water Commissioners—Water for Municipal Sprinkling—Compensation.

Pub. Acts 1853, p. 182, under which the Board of Water Commissioners of Detroit was organized, gave the control of the city water works to such board, which, at Section 7, made it the duty of the board to equip itself, lay pipes, etc., and to furnish a full water supply for public and private use in the city. The act authorized the board to fix the rate of furnishing water to private consumers, but contained no provision for the payment of water used for public purposes. Section 8 gave the Commissioners power to construct fire and public-use hydrants at such locations as they deemed expedient. The act of 1873 provided for a loan of \$1,000,000, and an annual tax of \$75,000 for the waterworks. Held, that the city could not be charged for water used for sprinkling the streets, the discretion of the board in the control of the hydrants, pipes, etc., being one to be reasonably exercised in the furtherance of the general design of the law, which, in providing public aid, contemplated a return of services to the public.—(Board of Water Com'rs of City of Detroit vs. Detroit Citizens' St. Ry. Co., 90 N. W. Rep., 657.)

MICHIGAN.—Village Ordinance — Construction — Railroads — Crossings.

A village ordinance authorizing a railway in a street provided that the track should be laid in the center of the street, and between certain points the space between the rails should be planked, and two planks placed outside the rail, and that on the remainder of the street the company should maintain public and private crossings, constructed in the same manner as therein provided for planking. In another section the ordinance provided that the company should maintain pine plank crossings at all cross and intersecting roads and highways, and private crossings where they then existed, or should become necessary. Held, that the latter section did not require the construction of crossings from sidewalk line to sidewalk line, but merely designated the location of the crossings required

by the former section.—(Village of Dearborn vs. Detroit, Y., A. A. & J. Ry., 90 N. W. Rep., 688.)

MISSOURI.—Street Railroads—Construction of Road—Ordinance—Fraud in Passage—Rights of Abutting Property Owner—Damage — Injunction — Petition — Sufficiency — Allegation of Fraud.

1. A petition in a suit against three street railroad companies to enjoin them from laying their tracks in a street, which alleges that the ordinance authorizing the construction of the road was obtained by fraud of the defendants, their agents, servants and attorneys, in bribing aldermen, councilmen and members of the municipal assembly by paying or promising to pay money, stocks, bonds or privileges to such officers, is uncertain and insufficient in failing to specifically state the acts constituting the fraud.

2. A demurrer to the petition does not admit the truth of such allegation, as the allegation does not state a traversible fact, and a demurrer only admits facts which are well pleaded.

3. An allegation in a petition to restrain a street railway company from laying double tracks in a street that it is a narrow street and that such tracks will greatly impair its usefulness in not leaving room between the tracks and curb for wagons to pass is a mere conclusion and insufficient to show a use of the street which will practically destroy it as a highway and authorize an injunction to restrain the railroad's construction.

4. Revised Statutes, 1889, section 1825, requiring street railroad corporations, before taking or damaging any property in the construction of their railroads, to determine and pay all damages caused to the owners of real or personal property, does not give a right to damages not existing before the passage of the act, and a property owner is only entitled to damages which are peculiar to his property and not common to all abutting owners.

5. The act of a street railroad company in tearing up the street preparatory to building its road and piling ties and rails in the street, being a necessary incident to the construction of the road, is not such a damage to an abutting property owner as will authorize an injunction to restrain the construction of the road. (Nagel et al. vs. Lindell Ry. Co. et al., 66 S. W. Rep., 1090.)

NEW YORK.—Elevated Railroads—Abutter's Action for Damages — Injunction—Misjoinder—Costs—Infant Plaintiff—Injunction—Infant Plaintiffs—Failure to Plead Infancy in Answer—Appeal—Injunction—Lessor and Lessee of Railroad.

1. In an action for rental and fee damages to abutting property from the building of an elevated railroad, instituted by executors and decedent's widow and children, wherein it appeared that the damages belonged solely to the widow and children, in the absence of any harm resulting to defendants from the misjoinder, the complaint should be dismissed as to the executors, without costs.

2. In an abutter's action for rental and fee damages from the building of an elevated railroad, wherein one plaintiff was an infant suing by guardian ad litem, an injunction was granted not to become operative for thirty days and providing that, if during that period defendants should pay or tender to plaintiffs the fee damages they should be entitled to operate their railroad and receive from plaintiffs a proper grant of such right, "to be executed by the person having any title to or lien upon" the abutting premises. Held, that defendants were not aggrieved by the judgment because one plaintiff was an infant, since the judgment did not pass upon the title to be granted, and defendants, after making tender, could continue to operate their road and could withhold payment until a proper grant was made to them, whether it was procured by proceedings under Code of Civil Procedure, section 2348, to sell the infant's interest in the premises or by waiting until the infant became of age.

3. Defendants having failed to raise in their answer the defense that one plaintiff was an infant such defense could not be relied on in the Appellate Court.

4. Although one of the defendants was lessor and the other lessee of the railroad in question, and the claim for damages covered both the period during which the lessor operated the road and that during which the lessee operated it, the judgment was correct in enjoining them both, unless the total fee damages assessed were paid. (Walsh et al. vs. Brooklyn Union Elevated R. Co. et al., 74 N. Y. Supp., 1019.)

NEW YORK.—Street Railroads — Operation — Mandamus—Powers of Directors—Parallel Lines.

1. Mandamus to compel a railroad company to do a particular act in constructing its road or in running its trains can be issued only when there is a specific legal duty to do the act and clear proof of a breach of such duty.

2. General corporation law (Laws 1892, chapter 687), section 29, provides that the affairs of every corporation shall be managed by its directors. Railroad law (Laws 1890, chapter 565), section 4, directs that every railroad corporation may regulate the time and manner in which passengers and property shall be trans-

ported, and section 34 requires every railroad corporation to run its cars at regular times, to be fixed by public notice, and furnish sufficient accommodations for passengers. Held, that a lessee of systems of elevated railroads, discontinuing parallel lines and operating only one of them, and then only during certain hours of the day, but transferring its passengers to its surface road without charge, cannot be compelled by mandamus to operate such parallel lines, in the absence of allegations that it had not furnished a reasonable service, since a company may operate its trains on a fixed schedule at any hour of the day or night which best subserves its purposes. (*People ex rel. Linton vs. Brooklyn Heights R. Co.*, 75 N. Y. Supp., 202.)

**NEW YORK.—Street Railways—Fee in Street—Condemnation.**

Laws 1890, c. 565, art. 1, section 2, authorizes the incorporation of both steam and street railways. Sections 4 and 7 declare that every railroad corporation may acquire necessary real estate by condemnation, etc. Section 90, after providing that every street railway corporation, on complying with section 91, shall have power to construct and operate its roads on and along the streets, avenues, etc., described in its certificate of incorporation, and to acquire title by condemnation, adds, "Nothing in this section shall be deemed to authorize a street railroad corporation to acquire real property within a city by condemnation." Section 91, as required by Const. art. 3, section 17, provides that, before a railway is constructed in a street, the consent of the local authorities and of the owners of one-half in value of the abutting property must be obtained. Held, that the last clause of section 90 does not prohibit the acquiring an easement to construct and operate a street railway on a city street by condemnation, the fee in which belongs to abutting owners.—(*Adee vs. Nassau Electric R. Co. et al.*, *Lott et al. vs. Same*, 76 N. Y. Supp., 589.)

**NEW YORK.—Street Railroads—Connections with Steam Railroads—Statutes—Construction—Right to Connect—Necessity.**

1. Laws 1884, c. 252, providing for the construction, maintenance, and operation of street surface railways, declares that they shall have all the privileges granted, and be subject to all the liabilities imposed, by Act 1850, authorizing the formation of railroad corporations. Act 1850, c. 140, re-enacted in Railroad Law 1890, section 4, subd. 5, conferred on every steam railroad the right to cross, join, or unite its railroad with any other railroad before constructed, at any point on its route, and on the grounds of such other railroad company, with the necessary conveniences in furtherance of the object of its connection. Railroad Law 1890, section 12, provides that every railroad corporation whose road is or shall be intersected by any new railroad shall unite with the corporation owning such new railroad in forming necessary intersections and connections, and grant the requisite facilities therefor. Held, that such provisions do not confer on street railway companies the right to join and unite with steam railroads so as to facilitate a free interchange of cars between them.

2. Under Railroad Law 1890, section 12, providing that every railroad corporation whose road is or shall be intersected by any new railroad shall unite with the corporation owning such road in forming the necessary connections, where a street railway company seeking to compel a steam railroad company to interchange cars with it is operated for its entire length parallel with the steam railroad, and does not transport any freight destined to any point on such railroad line, there is no necessity entitling it to such connection and interchange of cars, even if it be conceded the right to make application to the court therefor.—(*Stillwater & M. St. Ry. Co. vs. Boston & M. R. R.*, 76 N. Y. Supp., 69.)

**NEW YORK.—Res Judicata.**

Where a firm recovered a judgment against a street railroad company for damages to the firm horse and wagon, caused by the negligence of the street railroad company, and the question of the company's negligence and the contributory negligence of one of the firm who was driving the team had been litigated in that action, the judgment rendered therein in favor of the firm is admissible in the driver's favor, in an action brought by him alone to recover for personal injuries received.—(*Cahnmann vs. Metropolitan St. Ry. Co.*, 75 N. Y. Supp. 970.)

**PENNSYLVANIA.—Amendment—Changing Cause of Action—Limitations—Street Railways—Notice to Pave.**

1. An amendment to a complaint in an action by a city against a street railway company for the cost of paving between its tracks changes the cause of action, and therefore can not be made after the lapse of the period of limitations; the original complaint seeking to recover by virtue of defendant's charter and certain ordinances, and the amendment seeking it under charters of companies which made leases to, or were merged with, defendant.

2. Under an ordinance requiring a street railway company to pave after notice by the highway commissioner, and providing that, if it fails to comply with the notice, he shall do the paving—the cost to be collected of it by the city—the city cannot, without

notice to the company to pave, itself do the paving, and recover therefor from the company.—(*City of Philadelphia vs. Hestonville, M. & F. Pass. Ry. Co., Same vs. People's Pass. Ry. Co.*, 52 Atlantic Rep., 184.)

**PENNSYLVANIA.—Street Railway Company—Liability for Paving Street—Estoppel—Ratification.**

1. A street railway company, which, under its charter, is not liable for any paving or re-paving of streets, but only for repairing between its tracks, is not liable for paving, though, when informed that the city has made a contract for a company to pave the street, said company to look to the street railway company alone for the cost of the paving between the tracks, it in no way repudiates the contract.

2. One, by making a payment for work done under a contract, does not make or ratify any contract making it liable thereunder, it at the time being stated that this is not to be regarded as an admission of liability for anything more.—(*City of Williamsport, to Use of Sicilian Asphalt Pav. Co. of New York, vs. Williamsport Pass. Ry. Co.*, 52 Atlantic Rep., 51.)

**SOUTH CAROLINA.—Continuance—Absent Witnesses—Affidavit Admitted—Impeachment.**

1. An exception based on a point not raised below will not be considered on appeal.

2. Where, on motion for continuance because of an absent witness, the statements of the witness made in writing are admitted as his evidence, if present, it is competent to contradict them by an affidavit made by such witness at another time and place, when at the time of the hearing on the motion for continuance opposing counsel went to trial with the understanding that he could contradict the statement, after stating that he would do so in that way.—(*Hutmacher vs. Charleston Consol. Ry., Gas & Electric Co.*, 40 S. E. Rep., 1029.)

**TEXAS.—Municipal Corporations—Taxation of Street Railroads—Franchises—Ordinances—Power to Exempt from Taxation—Appeal—Failure to Assign Error—Waiver.**

1. The charter of the city of Dallas (section 118) authorized the Council to levy taxes upon the franchises and all other property of street railroads; section 135 authorized them to regulate the making of tax lists for taxation of all property within the city limits, and to collect taxes thereupon; while section 134 authorizes them to assess the property and shares of "corporations, companies, banks and such other institutions" as the same were assessed by the State law in such cases provided. Held that, construing section 134 in the light of the statutes in force when it was adopted relating to assessment of banking corporations, together with the course of legislation on that subject providing for a special method of taxing banking corporations, it was not intended to limit the power conferred by sections 118 and 135 to tax street railway company franchises to the manner in which they were taxed by the State, but merely to give the Council power, if they wished to do so, to adopt the special State laws as to taxation of banking and like corporations.

2. Where a city, by ordinances, imposed upon a street railway company, as a condition for the granting of its city franchises, annual payments called "bonus," "franchise tax," etc., which were not based on any property valuation, its power to impose an ad valorem tax upon such franchises as authorized by its charter was not thereby taken away, since, even granting that the ordinances imported a contract of exemption from taxation, there being no legislative authority for such exemption, such contract would be void.

3. Any error in a ruling of the trial court cannot be reviewed in Supreme Court when not assigned as error in the Appellate Court.—(*City of Dallas et al. Dallas Consol. Electric St. Ry. Co.*, 66 S. W. Rep., 835.)

**VERMONT.—Eminent Domain—Railroad Right of Way—Vermont Statute—Same—Right of Action of Landowner.**

1. Under the laws of Vermont (V. S. Secs. 3814, 3826) a landowner who permits a railroad company to enter upon his land to construct its road without requiring the prepayment or deposit of the damages waives the right to exclude the company from the land for non-payment of the damages, and the company has two years within which to have the damages appraised and pay the same, after which, if not paid, the landowner may sue. Held, that where the question of damages was submitted to arbitration, an award was made, and the company took possession and constructed its road, but did not pay the damages, the remedy of the landowner was limited to an action upon the award.

2. Under such statute, where a company has entered upon and used land, either under an agreement with the owner, which it has failed to keep, or without any agreement, the landowner cannot maintain a suit or proceeding in equity to enforce a lien upon the road for the damages before the expiration of two years.—(*Bibber-White vs. White River Val. Electric R. Co.*, 111 Fed. Rep., 36.)

## FINANCIAL INTELLIGENCE

### THE MARKETS

#### The Money Market

WALL STREET, Aug. 27, 1902.

At the present writing the money market is feeling the good effects of last Saturday's favorable bank return. The increase of over \$2,500,000 in surplus reserve then reported, resulted entirely from the decrease of over \$10,000,000 in loans. This in turn reflected the offerings of funds from out-of-town centers and from local trust companies, which were attracted by the comparatively high-money rates prevailing here at that time. Apparently this lending of outside capital has ceased with the decline in rates this week, and a further contraction in the loan account is uncertain, the more so after the resumption of active speculation on the Stock Exchange. Meanwhile the expected outflow of cash to the interior has already begun in some quantity, and the probabilities are that cash holdings of the New York banks will sink considerably lower during the next few weeks. In view of this practical certainty, the 4 per cent call money rate now quoted is not likely to last very long. We shall doubtless see a more or less stable figure of 6 per cent after another fortnight or so. This condition, in fact, must arrive before the various counteracting influences to the harvest currency demands are set in operation. The higher rate will, in all probability, induce a renewal of the foreign credit advances which were such a feature ten days ago, and it is even possible that in the end some gold will be imported from Europe. The fresh weakness developed in the exchange market this week is unquestionably significant in this connection. Beyond the accommodations from the markets abroad, and the casual gold arrivals at the Pacific ports, the only chance of relief for the local banks lies in some extraordinary action by the Treasury Department. Secretary Shaw has announced that while he will buy no more bonds, he is prepared to increase government bank deposits, if necessary, twenty or thirty millions. Provided there is no trouble in obtaining the requisite bond security, this will afford a very important assistance. The main point in the situation is, however, that while no actual stringency may develop, money market rates will have to go up and stay up in order to avert it.

#### The Stock Market

The buoyancy of the general stock market during the week has been rather of a surprise to the rank and file of Wall Street observers. There has been only one day on which prices have not advanced, while the upward movement has been accompanied, if not by a broadening of interest, at least by a steady increase in the volume of transactions. The public is not in the market any more than it has been at any time this season, but as a speculative factor the absence of a large demand is fully offset by the scarcity of the supply of securities offered for sale. Investors are not selling, in the first place, because the general outlook for continued prosperity is inconsistent with the idea of any important decline in prices, and, in the second place, because there is no other field of investment which promises any better returns were capital withdrawn from the security market. Consequently we have the peculiar, if not unique situation, where the supply of stocks does not increase with the progress of the advance. Presumably there is some limit to this sort of movement, for market quotations cannot, in the laws of natural events, exceed indefinitely the standard of real values. But even the most skeptical critics cannot as yet point to any definite sign that the end is at hand. The uncertainty of what next month's money market may have in store, is the most formidable check, both actually and potentially, upon present operations for the rise. If the experience of the past is worth anything at all, it is well to recall that September has never proved a "bull" month in the stock market. It is possible that the solution of the money problem will be easier than is now apprehended. Should the Treasury come to the rescue in the manner suggested, or should the West and South draw less heavily than usual upon Eastern bank reserves, it is conceivable that the money market may not prove the check it has in former years. There is still enough uncertainty, however, to make the conservative class in Wall Street willing to leave the stock market in the hands of the more venturesome speculators who now control it.

Manhattan has been the only member of the local traction group to show any life in the week's trading. Some covering of short contracts put out at the time of the threatened strike, has been noticed, but no attempts have been made to advance the price by any interests, speculative or otherwise associated with the property. If the general speculative movement keeps up long enough, the tractions will doubtless have their turn, but at the moment they are being left alone by the talent who are devoting their energy and resources to the more active railroad issues.

#### Philadelphia

Traction stocks in Philadelphia have, as a rule, continued very strong during the past week. Philadelphia Rapid Transit rose to 15, the highest on record, under heavy buying. At that figure heavy realizing sales appeared, and the stock lost part of its advance. Union Traction remained steady around 48, and Philadelphia Traction on investment purchases rose to 100. American Railways advanced again from 50 to 51, the latter figure being the highest the stock ever sold. The talk in connection with this movement is that the dividend will be increased at the next quarterly meeting from an annual 5, to a 6 per cent rate. Lack of confirmation for the reported sale of the road caused a reaction in Fairmount Park Transportation to 31½. Railways General was bid up from 5½ to 5½, Consolidated of New Jersey sold at 69, Easton Electric at 19½, and United Traction of Pittsburgh preferred at 52. The week's bond sales comprised American Railways 5s at 103¾ to 103½, Electric People's Traction 4s at 99¾, Indianapolis Railway 4s at 87½ and United Railways 4s at 87.

#### Chicago

The Chicago stocks have, as a rule, been dull but firm during the week. Union Traction common sold up from 16 to 16½, and the preferred from 50 to 50½, while City Railway dipped to 211, and then rallied to 215. West Chicago fluctuated between 94¾ and 95. Trading was too light in these stocks, however, to possess any significance. Among the elevated securities fair activity developed in Northwestern common at 36½, and in Lake Street, the latter moving up a fraction to 107½. Metropolitan common sold at 39, and later at 38½, with sales of the preferred at 90. Plans for extensions on all these lines are maturing, but no definite announcements are expected in the fall. Metropolitan will then be at work on its new downtown terminal. Financing of the Metropolitan and Northwestern improvements has been arranged, but considerable interest as well as uncertainty is expressed as to the similar arrangements on the South Side Elevated. The last-named company is to build 13 miles of new single track, and this, with the other additions and changes, is expected to cost several million dollars.

#### Other Traction Securities

Boston traction stocks have been rather depressed during the week, without any definite reason, apart from its being an ordinary speculation reaction. Boston Elevated, after rallying from 159 to 160 declined again to 158. Massachusetts Electric showed the effects of further liquidation, selling down to 38½, which is the lowest reached in a long time. The preferred yielded a half point to 97½. In Baltimore there has scarcely anything been doing outside of United Railways and Nashville Railway issues. The United Railway incomes touched top on the present movement at 71½, but later reacted to 71¼. The general 4 per cents, after selling at 98½, went back to 98. The stock was steady around 16. Speculative circles are inclined to regard the operations in Nashville Railway as purely speculative manipulation. The 5 per cent trust certificates rose as high as 76¾ during the week, but ended at 76. The stock sold between 6 and 6¼. The only other traction sales in Baltimore were Newport News and Old Point 5s at 109½, and Norfolk Railway & Lighting 5s at 96. On the New York curb American Lighting and Traction (800 shares) sold up ¾ to 40¾, and 1000 American Elevated sold at 1½. A few hundred New Orleans common sold at 17¾ to 17½, with sales of the 4½ per cent bonds at 88 and 87½. San Francisco common was weak at 22½. Toledo Railways changed hands at 33¾ to 33½, and a single lot of Camden & Trenton went at 4. The rise in Columbus Street Railway in the Western markets continued, the common getting up as high as 58 and the preferred to 108. Traction sales on the Cleveland stock exchange last week numbered 3970 shares, compared with 3107 shares for the week before. Cleveland Electric Railway, which has been comparatively quiet for some time, because of lack of offers, lead with sales of 1260 shares. The price advanced from 87 to 92½ during the week. A hint as to the probable terms of consolidation was responsible. It is thought the stock will soon reach par. Northern Ohio Traction common made a sensational leap from 45 to 55 in two days, the big advance bringing out only 1129 shares. It reacted later to 54. The preferred also advanced, sales being 927 shares from 91 to 94¾. The opinion is gaining ground that the common of this road is being somewhat inflated since it is not yet on a dividend-paying basis. Cincinnati, Dayton & Toledo, the star issue of previous weeks, was comparatively inactive, 100 shares selling at 27. Western Ohio strengthened, from 24½ to 25,260 shares selling. The bonds of this company have been in considerable demand at 82. Elgin, Aurora & Southern, which has been inactive for some time, is again attracting interest, largely due to the fact that the



Aurora, Elgin & Chicago, a connecting line, has just been placed in operation and will greatly increase the earnings of the other road. Lake Shore Electric, which dropped somewhat last week, advanced from 17 $\frac{3}{4}$  to 18 for small lots. Monday there was a sale of this at 18 $\frac{3}{4}$ , and 23 is now asked. On the same day 235, Elgin, Aurora & Southern, sold at 41 $\frac{1}{2}$ . Twenty Northern Ohio Traction preferred went at 94 $\frac{1}{2}$ , and 25 Cleveland Electric at 91 $\frac{1}{2}$ . A sale of 100 shares of Cleveland City Railway was made at 114, the first of this stock to change hands in some time. Ten thousand Western Ohio bonds sold at 82 and 82 $\frac{1}{4}$ .

**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	
	Aug. 19	Aug. 23
American Railways Company .....	49 $\frac{3}{4}$	50 $\frac{1}{2}$
Boston Elevated .....	159 $\frac{1}{2}$	a158
Brooklyn R. T. ....	67	67 $\frac{1}{2}$
Chicago City .....	210	210
Chicago Union Tr. (common) .....	16	16
Chicago Union Tr. (preferred).....	48	48
Cleveland Electric .....	88	91 $\frac{1}{4}$
Columbus (common) .....	57	57
Columbus (preferred) .....	108	108
Consolidated Traction of N. J.....	69 $\frac{1}{2}$	69
Consolidated Traction of N. J. 5s.....	111	111
Detroit United .....	86	86
Electric People's Traction (Philadelphia) 4s.....	99 $\frac{3}{4}$	99 $\frac{3}{4}$
Elgin, Aurora & Southern .....	40 $\frac{1}{4}$	45
Indianapolis Street Railway 4s.....	87 $\frac{1}{2}$	87 $\frac{1}{4}$
Lake Street Elevated .....	10 $\frac{1}{2}$	10 $\frac{1}{2}$
Manhattan Railway .....	135 $\frac{1}{8}$	135 $\frac{1}{4}$
Massachusetts Elec. Cos. (common) .....	40	39 $\frac{3}{4}$
Massachusetts Elec. Cos. (preferred) .....	97 $\frac{1}{2}$	97
Metropolitan Elevated, Chicago (common) .....	38 $\frac{1}{2}$	39
Metropolitan Elevated, Chicago .....	*89 $\frac{1}{2}$	89
Metropolitan Street .....	147 $\frac{1}{2}$	147 $\frac{1}{2}$
North American .....	122 $\frac{1}{4}$	121 $\frac{1}{4}$
Northern Ohio Traction (common) .....	51	51 $\frac{1}{2}$
Northern Ohio Traction (preferred) .....	91 $\frac{1}{2}$	94
North Jersey .....	36	35 $\frac{1}{2}$
Northwestern Elevated, Chicago (common).....	..	36 $\frac{1}{2}$
Philadelphia Rapid Transit .....	14	14 $\frac{3}{4}$
Philadelphia Traction .....	99 $\frac{3}{4}$	99 $\frac{3}{4}$
St. Louis Transit Co. (common) .....	31 $\frac{3}{4}$	32
South Side Elevated (Chicago) .....	110	110
Southern Ohio Traction .....	75	..
Syracuse Rapid Transit .....	27	..
Syracuse Rapid Transit (preferred) .....	70	a75
Third Avenue .....	130	131
Toledo Railway & Light .....	33 $\frac{3}{4}$	..
Twin City, Minneapolis (common) .....	127 $\frac{1}{4}$	127
United Railways, St. Louis (preferred) .....	84	84 $\frac{1}{2}$
United Railways, St. Louis, 4s.....	87	87
Union Traction (Philadelphia) .....	48	47 $\frac{3}{4}$
Western Ohio Railway .....	24 $\frac{1}{2}$	24
New Orleans Railways (common) .....	17 $\frac{3}{4}$	17 $\frac{3}{4}$
New Orleans Railways (preferred) .....	56 $\frac{3}{4}$	56 $\frac{3}{4}$

\* Ex-dividend. † Last sale. (a) Asked. (b) Ex-rights.

**Iron and Steel**

The feature of the iron market continues to be the shortage in domestic production of pig iron, and the consequent increasing applications for the necessary supplies in the foreign markets. Scarcity of fuel supply, and over-crowded transportation facilities are the causes for the deficiency in the home output. Steel is unchanged, the smaller demand for the lighter lines of finished products being evenly balanced by the larger demand for the heavy lines. Quotations are \$21.75 to \$22 for Bessemer pig, \$32 for steel billets and \$28 for steel rails.

**Metals**

Quotations for the leading metals are as follows: Copper, 11 $\frac{1}{2}$  cents bid; tin, 28 cents bid; lead, 4 $\frac{1}{8}$  cents, and spelter, 5.45 cents.

GADSDEN, ALA.—The Alabama City, Gadsden & Attalla Railroad has asked permission of the State to increase its capital stock from \$100,000 to \$200,000.

CHICAGO, ILL.—The statement is made in Chicago that 75 per cent of the stock of the Lake Street Elevated Railway is opposed to any assessment in the proposed readjustment of the company's finances.

INDIANAPOLIS, IND.—The report that Philadelphia interests are planning a consolidation of the electric railways here will not down. It is said in some quarters that the Indianapolis Street Railway and the Union Traction are to be consolidated, while in other quarters the report that the deal will include all the Indianapolis street railways and the interurban lines is current.

BOSTON, MASS.—The Railroad Commissioners have approved the issue by the Boston Elevated Railway of 33,000 new shares of new stock, to be applied as follows: \$806,500 to be applied to the payment of cost of construction and equipment of the elevated structure, including foundations, tracks and electric system; \$296,800 to be applied to the payment of cost of construction and equipment of power stations; \$471,000 to be applied to payment of construction and equipment of terminal and other stations, exclusive of land; \$69,700 to be applied to the payment of the cost of equipment of subway; \$580,600 to be applied to the cost of rolling stock and equipment of same; \$161,200 for miscellaneous expenses incurred in construction of railway; \$862,500 for real estate and payment of damages caused by railway construction; \$51,600 for cost of machinery, tools and miscellaneous equipment of railway. Any surplus in proceeds of stock over and above the amount actually required to provide for the above payments as specifically named is to be held subject to the further order of the Board of Railroad Commissioners.

NATCHEZ, MISS.—All the stock of the Natchez Street Railway & Power Company except that held by J. W. Lambert, E. H. Ratcliff and S. H. Lowenberg, has been sold to Gen. S. S. Bullis, of Gulfport, Miss., former president of the Gulf & Ship Island Railroad, and W. B. Rogers, of New Orleans. The company operates 6 miles of track. New directors for the company have been elected as follows: W. B. Rogers, W. R. Moorman, J. H. Levy, of New Orleans; S. S. Bullis, E. H. Ratcliff, S. H. Lowenberg and J. W. Lambert, of Natchez. Mr. Rogers was elected president, Mr. Lambert, vice-president, and W. R. Moorman, secretary and treasurer. E. H. Jackson, who has been general manager and one of the largest stockholders, retires from the company.

LINCOLN, NEB.—Minority stockholders of the Lincoln Traction Company have called a meeting to protest against the action of directors in contracting with the Lincoln Heat & Power Company for heat and power at what they claim is a direct loss. Large stockholders of the Traction Company are said to have organized the Heat & Power Company.

BUFFALO, N. Y.—The International Railway Company reports earnings as follows

	1902	1901	1900
Gross receipts .....	\$266,067	\$393,684	\$213,823
Operating expenses .....	147,613	192,264	106,173
Earnings from operation .....	\$118,451	\$201,419	\$107,649
Receipts from other sources .....	5,180	15,520	4,915
Gross income .....	\$123,631	\$216,940	\$112,564
Fixed charges .....	97,042	94,098	65,348
Net earnings .....	\$26,588	\$122,842	\$47,216
Quarter ending June 30	1902	1901	1900
Gross receipts .....	\$772,384	\$922,639	\$615,306
Operating expenses .....	436,914	485,898	333,927
Earnings from operation .....	\$335,469	\$436,740	\$281,379
Receipts from other sources .....	13,896	30,153	16,065
Gross income .....	\$349,365	\$466,893	\$297,444
Fixed charges .....	289,062	272,863	221,843
Net earnings .....	\$60,303	\$194,030	\$75,600

Comparison is made with the figures of 1900 because with those of 1901, including, as they do, the increased traffic consequent to the Pan-American Exposition, no equitable comparison between 1902 and 1901 can be made.

NEW YORK, N. Y.—The proposition to increase the capital stock of the Interborough Rapid Transit Company from \$25,000,000 to \$35,000,000 has been approved. It is said that the purpose of the increase is to raise funds to defray the expense of building the projected tunnel from Manhattan to Brooklyn, connecting with the Manhattan underground system; 100,000 shares of stock will be issued at \$100 par value.

NEW YORK, N. Y.—The voting trust certificates representing stock of the Interborough Rapid Transit Company are now ready for delivery, on surrender of stock or subscriptions for stock of the Rapid Transit Subway Construction Company. Holders of subscription for stock of the Subway Operating Company will receive voting trust certificates representing the stock subscribed for, with 40 per cent already paid in indorsed upon the certificates.

CLEVELAND, OHIO.—Denison, Prior & Company, of Cleveland, have purchased from Townsend, Reed & Company, of Indianapolis, \$500,000 of the first mortgage bonds of the Indianapolis, Shelbyville & Southeastern Traction Company.

CLEVELAND, OHIO.—At the time the Everett-Moore syndicate sold \$600,000 of Northern Ohio Traction preferred to a Cleveland and Cincinnati syndicate certain outside stockholders agreed not to sell their stock at less than par before Oct. 15, 1902. Because of the great increase in the price of this stock, and the unusual demand for it, Trustee E. W. Moore has notified these stockholders that they have been released from their agreement. They are given the right to sell their stock at any time under certain conditions.

PHILADELPHIA, PA.—The directors of the American Railways Company have declared a dividend of 1 $\frac{1}{4}$  per cent, payable Sept. 16.

KNOXVILLE, TENN.—The Knoxville, Sevierville & Kimberlin Heights Electric Railway, incorporated in November, 1901, to build an electric railway from Knoxville to Sevierville, with a branch to Kimberlin Heights, has filed a mortgage to the Central Trust Company, as trustee, to secure \$1,000,000 bonds. The preliminary capital stock of the company was \$10,000, but on June 6 this was increased to \$1,000,000.

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.

Table with columns: COMPANY, Period, Total Gross Earnings, Operating Expenses, Net Earnings, Deductions From Income, Net Income, Amount Available for Dividends. Rows include companies like AKRON, O., ALBANY, N. Y., BINGHAMTON, N. Y., BOSTON, MASS., BROOKLYN, N. Y., BUFFALO, N. Y., CHARLESTON, S. C., CHICAGO, ILL., CLEVELAND, O., CLEVELAND & Eastern Ohio Trac. Co., CLEVELAND EL. Ry. Co., CLEVELAND, Elyria & Western, COVINGTON, KY., DENVER, COL., DETROIT, MICH., DETROIT and Port Huron Shore Line, DULUTH, MINN., ELGIN, ILL., FINDLAY, O., HAMILTON, O., LONDON, ONT., MILWAUKEE, WIS., MINNEAPOLIS, MINN., MONTREAL, CAN., NEW YORK CITY, OLEAN, N. Y., PHILADELPHIA, PA., ROCHESTER, N. Y., SYRACUSE, N. Y., TOLEDO, O., and NEW BRIGHTON, S. I.