

dress. The latest field of their work is Philadelphia, and despite the fact that the Quakers are given credit for hard-headedness, they seem to have proved just as susceptible to the temptations of the ticket manipulators as the residents of other cities. It should be unnecessary to explain again the plan on which the ticket scheme is worked, as it should be familiar to all by this time. It is simply a case of robbing Peter to pay Paul, the Peters and Pauls increasing until the manipulators find it convenient to seek other fields of operation. Some time ago the United Railways & Electric Company, of Baltimore, thwarted the attempt of a band of ticket manipulators to operate in that city by stopping the sale of tickets entirely, and now the Union Traction Company, it is reported, has found it necessary for the protection of the credulous patrons of its lines to adopt a similar policy. The fact that the street railway company is not a party to the transactions in which the endless chain manipulators figure does not protect it in all cases from criticism, and because of the moral effect upon the community the company finds it advisable to interpose an effective check upon these operations by suspending temporarily the sale of tickets wherever the game is tried.

News from the Berlin-Zossen Tests

A little further news from the remarkable series of experiments made during the past winter on the Berlin-Zossen line, has come to light in the form of a consular report. It gives such general information as has been allowed to come to the public, but what is of vastly greater importance, it gives a brief abstract of a paper read by Herr Lochner, who represented the Prussian Government in the Zossen tests. The paper itself was withheld from publication, but some new facts were brought out. As already reported, the track used for the experiments was short, only 17.4 miles, and was composed of rail weighing about 64 lbs. per yard, and laid on metal ties. It was some years old, but had been carefully put in order for these tests. Up to nearly 80 miles per hour everything worked admirably, but as the speed was pushed higher the rails and ties proved too light for the strain, and the track began to give way and the cars to acquire a serious side sway. Above about 81 miles per hour this grew progressively worse, and finally became so menacing that the experiments were discontinued, although on two occasions the speed was pushed up to 99.4 miles per hour. Herr Lochner confirms definitely the statements already current that the motors and trolleys worked perfectly, even up to this extreme speed, and that the evident instability of the track was the only difficulty in the work. Unhappily the major part of the Prussian state railways are equipped with the rather light rail just mentioned, and metal ties, which have never had the best of reputations for making a first-class roadbed, are in well-nigh universal use. Some of the later equipments for important lines include a rail weighing 88 lbs. per yard, but the upshot of the matter from the government's standpoint is that most of the state railways are entirely unsuitable for the introduction of a very high-speed electric service.

It is certainly gratifying to know, however, that the motors and current-collecting devices proved entirely adequate up to about 100 miles per hour. We had no serious doubts about this part of the problem, but the track looked a little dubious from the very beginning. A 64-lb. rail would hardly be installed in this country for anything but very moderate service, either by steam or electricity. A track so lightly built might, perhaps, prove adequate for fairly high speeds if without sensible curves or grades, but certainly no engineer conversant with modern railway practice would expect it to answer for speeds approaching 100 miles per hour. Even the rail proposed ten years ago for the St. Louis-Chicago line was 10 per cent heavier than that on the Zossen line and, even so, was regarded as decidedly too light by most conservative engineers. For really fast running the rail should weigh 90 to 100 lbs. per yard, and should even at that weight be designed with especial reference to the work in hand. And a solid roadbed under the rails is of fully as much importance as the rails themselves. It must

be heavily ballasted and well settled into place before attempting fast runs. We wish the cars used in the Zossen tests could be given a trial on some of the fine stretches of track to be found on the New York Central and Pennsylvania systems, for there one would meet conditions favorable to success rather than prophetic of failure, and high-speed electric traction would not get a black eye from causes beyond its control. It is, however, most important to have definitely proved that the necessary current can be transmitted to a moving car, and that motors of adequate power can be readily applied to the task.

We are sorry, however, that no definite data as to the power consumption has as yet been made public. Herr Lochner's report is sufficient to indicate that the motors used, rated at about 1000 hp were entirely successful up to the highest speeds reached, but do not, of course, show whether a further increase of speed would have resulted in overloading them, or, indeed, what heating was found at the higher speeds actually tried. The figures for train resistances given in Mr. Davis's recent paper would indicate, if correct, that even at 90 miles to 100 miles per hour, the Zossen motors would have been enormously overloaded, but that such a condition actually occurred is not even indirectly hinted at by Herr Lochner, so that it seems that under the actual conditions of running the motors were not miscalculated with respect to the output required. Exact information as to the outputs really reached would be very valuable indeed in the present state of affairs, but it hardly seems likely that we shall hear much about it for the present. The continental manufacturers have a very bad taste left in their mouths by the row over the equipment of the Inner Circle, and are not likely to give much gratuitous help to American engineers in making further inroads upon the foreign market. And, in fact, it would be hardly reasonable to expect it, considering the profound secrecy that is often observed among American manufacturers who think they have a good thing. We earnestly hope that some of our American engineers will have the chance to show what they can do in high-speed work before long, for the Zossen work has apparently relegated us to the back row in such matters, and if the long-promised 100-mile-an-hour road is to be built anywhere on this side of the water there is grievous need of experimentation. Every few months we hear that the steam railway record has been pegged up a bit higher, especially in long-distance runs, and unless electrical engineers propose to balk at the jump they must limber up beforehand. It would be downright exasperating if the first really high-speed train put into service in the twentieth century was to be drawn by a commonplace locomotive, but there is some danger of it.

Franchises as Property

The report of Judge Earl, as referee in the special franchise tax law cases touches upon a point which is of very great interest to public service corporations throughout the country. The referee says that "while the franchises belonged to the State they were public property, held like other property for the benefit of the whole people of the State, or for the benefit of the people living in the city, where they had their sites, but when they were granted they became private property like other private property and became a part of the mass of property, within the State in private ownership, segregated from the public ownership."

Aside from the merits of the special franchise tax law this interpretation is important as indicating the exact status of franchises in law. Heretofore it has been held in many cases that franchises were merely permits or licenses, and corporations have contended that the compensation paid for these rights relieved the holders from further taxation. Under Referee Earl's findings, provided his position is finally sustained, these street rights are to be considered property in the nature of real estate easements, and in support of this contention the advocates of the Ford bill call attention to the fact that many of them were bought and sold as property before a rail had been laid or a spadeful of earth dug to improve them. The claim that it is impossible to fix a tangible value upon these rights is pronounced untenable, in view of the fact that busi-

ness men frequently deal in them. Valuation of such properties is admittedly difficult, but ex-Judge Earl points out that men find it possible to appraise them with sufficient accuracy for business purposes, and, therefore, he holds that the assessment "can be made with such an approximation to accuracy as will satisfy all the requirements of the law and the constitution."

This interpretation of the law is not final, of course; in fact, the referee's report, in which it is presented, is actually only the first step in the litigation, and many years may pass before final adjudication. But Judge Earl's position may rightly be taken as an indication of the trend of public opinion, and its influence upon the judicial mind. A few years ago such an opinion from a man of Judge Earl's position and political affiliations would create a profound impression; last week it was merely a surprise—a disagreeable one to be sure, to the investing public. It does not follow, however, that the higher authorities have been similarly affected, and final disposition rests with them.

Crowded Cars

The calamity howler is abroad again. This time he comes to warn us against the overcrowded car; rather an inopportune time, by the way, when most transportation companies are arranging to put on open cars, for it is not so much the physical discomfort against which complaint is made as the danger arising from the spread of disease and the unsanitary condition of closed cars generally. The provisions made for ventilation are pronounced grotesquely inadequate, and, such as they are, it is claimed, are not intelligently used. This involves the breathing of highly vitiated air for considerable periods of time by multitudes of people who are, especially at night, when wearied by the day's work, in the worst of conditions for resisting the assorted infections with which the air in most surface cars during these rush hours at night is heavily laden. The elevated cars are said to be less sanitary than the surface cars, since they are larger and their doors are opened less frequently to admit pure air. The claim that the electric cars are an improvement, from the medical point of view, upon their smaller and slower predecessors, is emphatically denied.

Not content with condemning the present methods the writer in question declares that conditions in New York will not be improved by the opening of the subway. The assumption that the air in the tunnel will be pure is pronounced unwarranted, and it is asserted that unless an elaborate and expensive system of ventilating fans is installed the public's expectation of safety and comfort in the subway is not going to be satisfied.

The article in which this gloomy view of the situation is taken was published in a medical journal, and the writer was represented as a prominent member of the medical profession. No doubt we should feel indebted to him for pointing out the dangers with which we are beset, but we are ungracious enough to think that unless he had a remedy to offer he ought to preserve a discreet silence. Probably it is too much to expect a member of the medical profession to prescribe even for the general public without receiving the customary fee; or, possibly, it may be that he recognizes his limitations and realizes that the problem is too big for him? Other men, who have had special training and large experience, have found the transportation problems in large cities difficult of solution. In New York it seems impossible to keep up with the growth of the city. The elevated and surface lines are operating as many cars to-day as can be accommodated. Every evening during the rush hours the cars on the principal surface lines run so closely together that there is reason for complaint on the part of pedestrians who are unable to proceed east or west without experiencing much delay and vexation. On the elevated, it is not an unusual thing to see three five-car north-bound trains from the Ninth Avenue and Sixth Avenue lines on the curve at 110th Street. This is about the limit of the present facilities. Of course, all the people who leave their places of business between 5 o'clock and 6 o'clock in the downtown district cannot be ac-

commodated with seats, and as they are all anxious to reach home as quickly as possible there is crowding and crushing on all lines for a short time. This has been explained over and over again until street railway men feel that everybody should understand and appreciate these conditions and not hold them accountable; and it has been pointed out that with our constantly growing cities we cannot reasonably expect any marked change. Americans will not wait for seats in trolley cars; they prefer to suffer the inconvenience and discomforts of standing in a crowded aisle, hanging on to a strap or being wedged into a corner on the platform—anything but delay. The express trains on the elevated afford convincing proof of this tendency. It may be absurd, but it is characteristic of the residents of large cities, and must be taken into account in considering these questions.

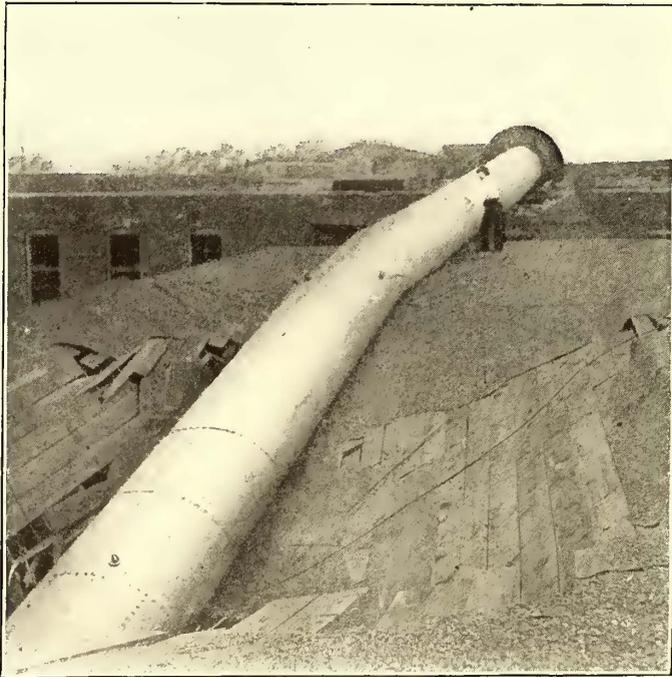
With the arrival of mild weather and the substitution of open cars for the closed cars, complaint is renewed against the persistent crowding of passengers into these cars after the seats are all occupied. The street railway companies are powerless in New York, in particular, and the newspapers are publishing all sorts of theories for overcoming the annoyance, none of them, however, offering a practicable solution. Double-deckers have been suggested, but their use is precluded by the elevated structures, which cross all the principal lines. It has also been urged that the seats be placed closer together, but this would result in as much discomfort as passengers standing in the spaces now provided. The normal carrying capacity of the open car is much less than the closed car, and the surface lines are much more popular in summer than in winter; consequently the problem is greatly complicated. Street railway managers will welcome a practicable plan for the relief of their patrons.

Chicago's Franchise Dispute

The street railway situation in Chicago furnishes an object lesson that other communities should study with profit. It is admitted on all sides that the transportation facilities are in a deplorable condition, and that they are constantly growing more and more inadequate, because of the inability of the operating companies to secure any guarantee from the municipal administration that would justify them in making the improvements that are necessary to bring the service up to the requirements of the city. The controversy between the companies and the city which has led up to this state of affairs is reviewed in a carefully prepared article, which is presented on another page of this issue. It is a conservative statement, and deserves the earnest consideration of all who are interested in this matter. At present there is practically a deadlock, and it is difficult to see how any relief is to be obtained until there is a radical change in the attitude of the city government toward the street railway companies. Aside from the question of the date of expiration of franchises, there are many minor points of difference between the city and the companies, but these could doubtless be settled amicably were it not for the disturbing element that has been injected into this controversy by those who desire to make political capital out of it. In fact, it is safe to say that but for the unreasonable opposition of the present city administration the whole subject would long since have been disposed of, and the people of Chicago would now be enjoying the improved service which they need so badly, and which the companies are desirous of giving. But as long as the question is open and the city adheres to its present policy, the companies will be forced to remain inactive. The short-sighted policy of the Mayor and his followers will merely tend to prolong the misery, and, in the meantime, the companies and their patrons will have to get along as best they can. We must confess a feeling of disappointment over the lack of interest which Chicago's business men have shown in this matter, for we cannot believe that they would be so blind to their own interests as to lend their approval, support and encouragement to such a piratical policy as the raid upon Chicago's street railway properties under the leadership of Carter Harrison. They should take charge of the settlement of this question.

Damage to the Kansas City Power House

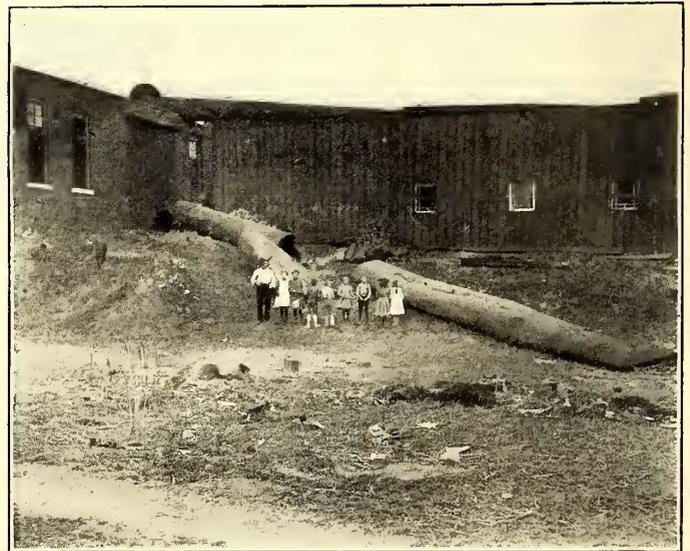
The accompanying illustrations show the effect of a small-sized cyclone which recently visited Kansas City, Mo. This damage occurred on Saturday, April 26. Starting as a high wind it blew a hurricane about 10:30 p. m., and a sudden gust struck the two smoke stacks of the power station of the East Side Electric Railway Company. One of these stacks was 40 ins. in diameter, and the other 36 ins. in diameter, both being about 85 ft. high. The smaller stack fell to the ground, the concussion breaking it into three pieces, but doing no damage to the surrounding buildings. The largest stack, however, fell on a frame building in the rear of the power house with sufficient force to crush in the roof. It also did some damage to the power house wall. This stack was a comparatively new one, and, strange to say, was itself uninjured, except for a slight flattening. Where the smaller stack separated the rivets were sheared off clean. Luckily for the railway company, this power house has not been in service for about two months, it



Kerr refrained from the use of technical terms as far as possible, and his lecture was highly appreciated by a large audience. It started with the subject of magnetism, showing the attraction and repulsion of an electromagnet by the poles, and discussed the whole subject through, showing the early types of Edison and Van Depoele motors and carried the description up to and including modern types of railway motors. A very clear description of the K type of controller was included, the lecturer showing the various combinations due to the "notches" on the controller. After the lecture the street railway band gave an impromptu concert, and some of the members assisted with special entertainments. The entire performance was a great success.

Mechanical Engineers at Boston

The American Society of Mechanical Engineers will meet at Boston, May 27, and continue four days. The professional sessions will be held at Engineering Building B, Massachusetts Institute of Technology. The opening session will be held in Huntington Hall, Tuesday evening, May 27, when Dr. Henry S. Pritchett, president of the Institute, and George S. Kimball, president of the Boston Society of Civil Engineers, which is the oldest engineering society in America, will welcome the members and their



EFFECTS OF A RECENT WINDSTORM IN KANSAS CITY

being used principally as an auxiliary during the heavy summer travel, the power for the line being, at present, furnished by the Central Avenue station. As it is also used in cold, winter weather, the accident occurred at the most opportune time for the railway company. The boilers and machinery were not in the least injured, and the stacks will be put up again at once. It is estimated that the total damage to the stacks, power station, etc., will amount to about \$1,250, which is wholly covered by cyclone insurance. The damage to the railway company's property was only a small part of a great deal of destruction done in all parts of the city by the same wind to trees and chimneys.

Comparative Accident Records at Indianapolis

President Hugh J. McGowan, of the Indianapolis Street Railway Company, is obtaining beneficial results from keeping comparative records of the number of accidents on the several lines of that system. At regular intervals a bulletin is posted, showing the number of accidents and number of cars operated on each route of the Indianapolis Street Railway for a given period. The motormen and conductors have taken much pride in keeping the records of their route as good as possible, and this competition, of course, has a good effect in making all the men careful and reducing the number of accidents. Comparative records of any detail of operation which are intended to promote competition between the men and thus improve the service are almost sure to have good results.

An Interesting Lecture to Street Railway Employees

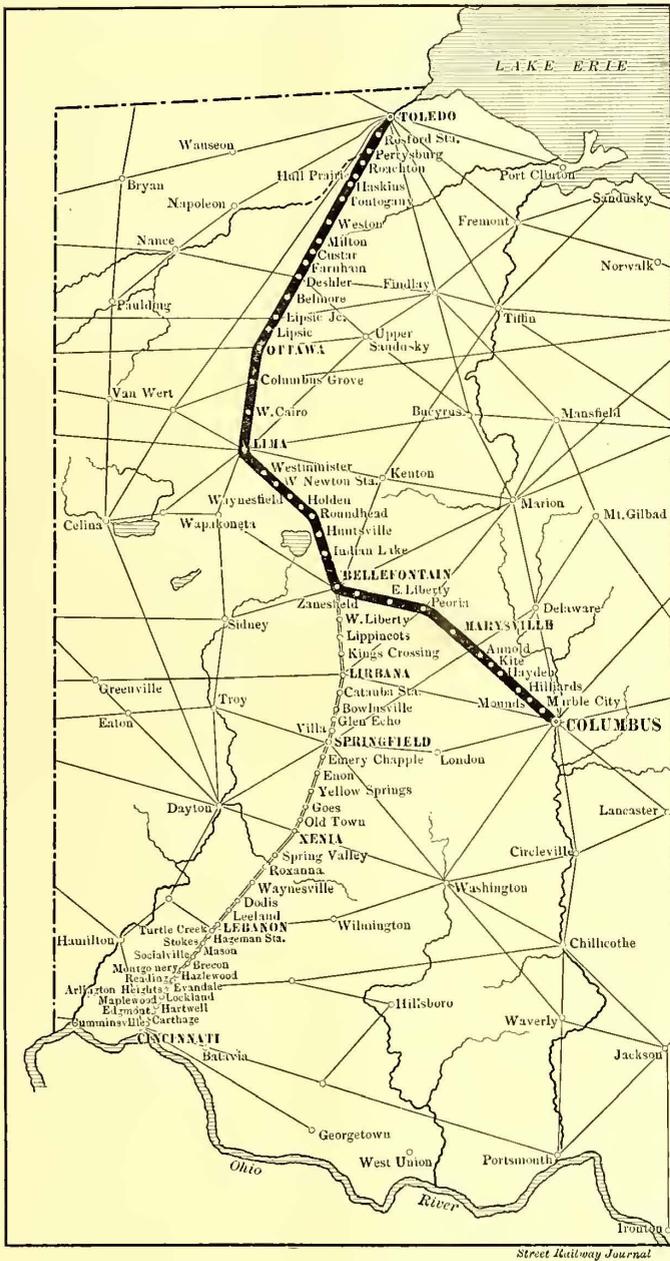
W. Wallace Kerr, of the Hebrew Technical Institute, New York, gave a most interesting talk before the Street Railway Employees' Association of Hartford, on the evening of Friday, May 9. Mr.

friends. On Wednesday the programme calls for the following features: "Final report of the committee appointed to codify and standardize the methods of making engine tests;" "Supplementary report of committee on standard pipe unions;" "Specifications for Steel Forgings, Castings and Boiler Plates," by W. R. Webster; "Tests of Steam Pipe Coverings," by George H. Barrus. On Wednesday evening papers will be presented as follows: "Repairing a Broken Cylinder," by H. M. Lane; "Construction of Atlantic Avenue Power Station, Boston," by I. E. Moulthrop and R. E. Curtis; "Swivel Joint for High-Pressure Main," by R. E. Curtis; "Determining Temperatures of Exhaust Gases in Combustion Engines," by R. H. Fernald; "Working Details of a Gas Engine Test," by R. H. Fernald; "Liquid Fuel Combustion," by Charles E. Lucke. Thursday's programme includes the following: "A Roller Extensometer," by Gus C. Henning; "Mechanical Stokers for Locomotives," by Fred H. Colvin; "Improved Indicator Cock for Engines," by A. K. Mansfield; "Electricity in Cotton Mills," by W. B. Smith Whaley; "Some Details of Direct-Connected Generator Sets," by William H. Bryan; "A Graphical Determination of Piston Acceleration," by J. N. Le Conte. On Friday the closing session will be held at 10:30 A. M. The society will be the guests of Harvard University. This session will be held in the lecture-room of Pierce Hall at Harvard University, Cambridge. Papers will be read as follows: "Technical Index and File," by R. H. Soule; "The Lowell Gaslight Company's Coal Pocket," by F. M. Bowman; "Elevator Safeties," by Charles R. Pratt; "The Flying Shear," by V. E. Edwards; "Standard for Machine Screws," by C. C. Tyler; "Cold Working of Sheet Metals in Dies," by John D. Riggs. At the close of the session, members of the society and ladies accompanying them will be guests of the president and fellows of Harvard University at lunch in the Harvard Union, at 1 p. m. After lunch, President Elliot will make a short address, and a reply will be made by the president. After this an opportunity will be given to visit the points of interest at the university.

New Interurban Road in Ohio

The accompanying map shows a proposed electric line which will connect Cincinnati and Columbus with the Great Lakes. The road will be known as the Toledo, Columbus, Springfield & Cincinnati Railway, and it is intended that it will carry passengers, United States mail, express, baggage and freight. The land over which the road runs is unusually level, there are few streams to cross, and therefore few bridges to build, and the adjoining land will furnish excellent gravel ballast. It is expected, therefore, that the cost of construction will be unusually low. A large part of the territory between Bellefontaine and Cincinnati is already covered by electric railways, and if right of way over these lines can be

have followed in a lesser degree the practice of steam railroads opening up a new country of taking in the entire population of the counties directly adjoining the line and including from one-third to two-thirds of the population of adjacent counties. In the electric road townships have been substituted for counties, and a belt averaging about three and a half miles wide on each side of the right of way, has been the basis for calculation. The population of the townships used in the prospectus of the road are taken from statistics of Ohio, and give a grand total of 867,856 for the possible effective population that the road may depend upon as passengers. Leaving out the large cities the population is, of course, much more dense south of Bellefontaine than between that city and Toledo, where, although the towns are numerous, they have but few inhabitants. This road, if built, will open up a neglected section of Ohio and will undoubtedly be of advantage to the farmers and the residents of the small towns along the line between Toledo and Bellefontaine. The capitalization is to be \$5,000,000, with no bonds, or \$20,000 per mile. About seven miles of road has already been constructed out of Lima, and the line to Toledo will be built as soon as satisfactory financial arrangements have been completed. On the map the straight lines show existing steam railway connections with the surrounding country seats. The officers of the Toledo, Columbus, Springfield & Cincinnati Railway Company are as follows: Ellis Bartholomew, president and general manager, Toledo, Ohio; A. F. McCormick, first vice-president, Columbus, Ohio; Benjamin F. James, second vice-president, Bowling Green, Ohio; I. N. Covault, secretary, Toledo, Ohio; William P. Heston, treasurer, Toledo, Ohio; G. A. Bartholomew, general superintendent, Lima, Ohio; X. H. Hollar, of Lima, one of the directors, is at present in New York, interesting Eastern capital in the proposition.



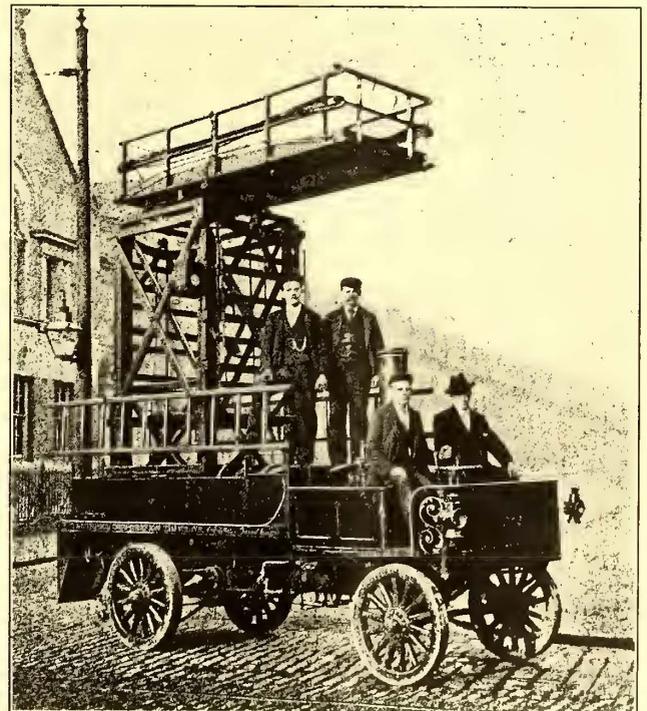
MAP OF PROPOSED OHIO INTERURBAN RAILWAY

secured by the new road the total length of the system will be about 250 miles.

The road runs through a great number of small villages between Toledo and Bellefontaine, and the promoters have compiled some extremely interesting figures as to the possible traffic to be obtained from the population along the route. These calculations are made on a somewhat different basis from that ordinarily adopted by conservative managements, but the subject is of such importance that it is useful to see the various methods by which receipts per capita can be predetermined. The precedent shows that it is hardly safe in estimating the possible revenue to be expected from an interurban railway proposition to take the population along the route for more than a half a mile at the outside on either side of the right of way. The management of the Toledo, Columbus, Springfield & Cincinnati Railway, however,

Automobile Repair Wagon

The accompanying engraving illustrates a novel form of repair wagon in use in Liverpool, England. It consists of an automatic tower with adjustable platform mounted on an automobile truck. The entire construction is made extra strong and the apparatus has proved of great value to the Liverpool Corporation Tram-



A MODEL TOWER WAGON

ways. This automobile tower wagon was supplied by the firm of T. Coulthard & Co., Ltd., Preston, the well-known engineers.

The Tramways Company of Seville has been granted permission to adopt electricity for its lines. A concession has been granted to the Tramways Company of San Sebastian for the extension of the electric lines in that city. Application has been made for a concession for an electric tramway service from Seville to San Juan de Azualfarache, for another line from Castille to Cuesta y Sines, and for another line from Camas to San Teponce.

Review of the Chicago Franchise Situation

So much has appeared in these columns in the last two years regarding the franchise question in Chicago that in reviewing the situation at the present time many things must necessarily be touched upon which have been discussed before. Nevertheless, in order to put the facts in condensed form for those who have not closely followed the history of the case, as related from time to time, some of the principal features will be reviewed.

The Chicago franchise question, as it is commonly called, has arisen out of the fact that a large number of franchises of the two large street railway companies operating in Chicago—the Chicago Union Traction Company and the Chicago City Railway Company—expire, according to the terms of the ordinances under which they were granted, in 1903. About four years ago attempt was made to secure legislation which would prolong the life of all franchises owned by Chicago companies, so that the companies could afford to go ahead with needed improvements and bring Chicago street railway lines thoroughly up to date. It was, of course, foreseen by the companies at that time that extensive overhauling would be necessary, including the change from cable to electric traction, of some of the most important lines. The Illinois Legislature passed laws which gave the needed extensions, but owing to great public opposition this law was repealed at the following session, leaving matters just as they stood before, with the time growing nearer when some of the franchises expire by limitation. For two years there has been much discussion regarding what should be done affecting the renewal of expiring franchises. The committee on local transportation of the Chicago City Council after many deliberations has outlined general plans under which it considered franchises should be renewed, leaving open, however, some important points.

The whole matter has, furthermore, been in an uncertain state, because of the possibility that it will be found that the franchises, which are supposed to expire in 1903, in reality run until ninety-nine years from the time the companies owning them were chartered, or until 1957 to 1960. Some able lawyers have expressed the opinion that these franchises are good for that period of time by virtue of the ninety-nine year charters granted by the Legislature in 1865. In order to test this matter, W. L. Elkins, of Philadelphia, as a stockholder in the corporations interested, brought suit for an injunction, asking that the city be enjoined from interfering with the operation of the North and West Chicago street railways, and that the court declare that the charters of these roads allow them to operate until 1958 and 1960, respectively. The petition also requested a settlement of the question of the companies' right to operate on certain streets, which, it is claimed, will expire in July of next year. Suit was brought in the United States Circuit Court because Mr. Elkins, as a stockholder, was a resident of another State. Last week, May 8, Judge Seaman decided that the Federal courts had no jurisdiction in such a case, and that it properly belonged to the State courts. Further than this, the Judge said that since the city had as yet taken no legislative action to forfeit the franchise there was no legal grounds for the contention that the city was attempting to impair the validity of the ninety-nine year charters. Of course, while there has been much talk on the part of the city officials and the council committee has been considering franchise extensions, no legal action was taken by the city at the time the suit was filed, although since that time the City Council has passed a resolution, calling upon the traction companies to formulate terms upon which they wish franchise extensions, and practically declaring a number of the franchises void after 1903. This decision, of course, has the effect of prolonging the discussion, settlement of which has already been delayed entirely too long for the welfare of either the companies or the public. If it should be decided ultimately that the franchises in question run until 1958 and 1960, the respective life of the charters of the companies, it would mean that the companies would at once raise capital for extensive improvements, otherwise the franchises expire next year, and in that event the question of making terms for franchise renewals affords abundant opportunity for speculation as to the probable outcome. In this connection it must be remembered that all of the franchises are not supposed to expire next year. The expiring franchises, however, do include many of the principal streets. If the franchises in question expire it will still leave the present street railway companies in possession of nearly all the cross-town lines and a few disjointed pieces of trunk line.

Supposing, as an extreme case, the city and companies should fail to come to terms as to the renewal of the franchises next year, the city would not be in a position to offer very great inducements for a new company to step in and operate on the streets for which the franchises have expired. The present companies can, indeed, offer the city much better terms for the renewal of expir-

ing franchises than could any new company, which would, of course, have nothing more than an incomplete system of city transportation, and which would, therefore, not pay the profits which a complete consolidated system could. Of course there is the possibility that the city might refuse to accept the terms offered by the present companies, and in that case the companies would, at first appearance, be in a bad predicament. When, however, it is realized that someone must supply the city of Chicago with local transportation daily, it is evident that while the politicians in control of the city government may indulge in buncombe and hold out for better terms than existing companies are able to give, certainly no new company can fulfill conditions that the existing companies find prohibitive. Matters will, therefore, remain at a standstill, and since local transportation is necessary, existing companies will continue to do the business on the old terms until such time as a settlement is made. This, however, is assuming an extreme case.

While it is true that public agitation and discussion of the street railway franchises has been going on very actively for over two years, and the public ideas as to what can be obtained by way of concession from the street railway companies have, perhaps, been raised to a point from which there must be some recession; it is also true that settlement of public questions of this kind usually takes place on a much more practical and common-sense basis than an observer would be led to suppose from the utterances of the radical element previous to the time the actual settlement comes. There is usually enough conservatism in a community to act as a balance wheel, and there is good reason to suppose that when the time comes for the actual settlement in Chicago very few of the extreme ideas which have been put forward so prominently in the discussions of the last two years will be incorporated in the final agreement. For example, municipal ownership has been advocated to such an extent that a test vote was taken at the recent spring election to determine the sentiment of voters upon this issue. Although the ballot on this question resulted in a great majority favorable to the project, it is admitted by those familiar with the existing state of affairs in Chicago that the probability of municipal ownership of street railways is a great distance away. In the first place, under the present laws of Illinois, the city has no power to own or operate street railways, nor has the city of Chicago any power to increase its bonded indebtedness for this purpose. Indeed, the matter of putting in a long-distance transmission plant for utilizing the power of the drainage canal to light Chicago and to run the waterworks has been under consideration for some time, and an attempt has been made to obtain a court decision as to whether the amount necessary for this can be legally raised. The matter has not yet been decided, and no one seems to care whether it is or not, aside from a few who realize how much it would be to the city's benefit to utilize this water-power rather than to generate power in the present city steam plants. A city which takes so little interest in the one talent which it has, is not likely to get more talents very soon. It is possible that a municipal ownership clause may be incorporated in ordinances granting franchise extensions at the present time, which will provide that the city may at some future time purchase the street railways, provided State legislation is obtained to do so. Municipal ownership, therefore, affects the present situation only so far as it affects the value of the investment at some future time, and it may have an important bearing in that way. In considering the terms of any franchise renewals, the companies can, of course, consistently refuse to consider any terms which will not sufficiently protect the investors at the expiration of franchises, and as long as the present companies are in a position to make better terms than could any new company, there is no good reason to suppose that the present companies can be forced into making terms which will not so protect the investors. That the foregoing analysis of the situation is generally considered correct by those who are thoroughly posted, is shown by the failure of the securities of the Chicago companies to fall greatly in value, in spite of the attitude of some of the city officers of Chicago, and the unfavorable agitation against the companies. Although, of course, there has been some decline in value at times, quotations on Chicago stocks have remained remarkably firm, which could not be the case if investors feared that franchises could not be renewed finally on living terms.

It is, however, an unfortunate state of affairs that this uncertainty as to the life and renewal of franchises has been continued so long without definite settlement. It is even more unfortunate for the people of Chicago than for the companies. The man who has done more to block a settlement than any other is Mayor Carter H. Harrison, and yet Mayor Harrison was re-elected in 1900 mainly on the strength of his radical utterances as to the wonderful things that he would accomplish in making a settlement with the street railway companies for franchise renewals. He is commonly quoted

as being violently opposed to doing anything whatever toward the renewal of franchises until the State Legislature shall have passed the necessary acts to enable the city of Chicago to own its street railways. It is, therefore, safe to say that if anything is done in settlement it will not be due to the Mayor, if he maintains his present position. That the Legislature will pass such laws is extremely unlikely.

The delay in settlement is unfortunate for companies and public, because it is retarding the legitimate growth and improvement of the street railways of Chicago. The people of Chicago suffer because the service is not what it would be had the improvements been made which the roads contemplated years ago, and which would have been made had a satisfactory settlement been reached. It is unfortunate for the companies because the delay tends to increase public dissatisfaction with present service, and thus tends to make a settlement harder in the end. As to just what terms of settlement will probably be made in case the courts determine that the franchises expire next year, it is not possible to predict exactly, but from the numerous conferences that have been held so far, and the general trend of opinion, it is likely that the terms will require either lower fares than straight 5 cents or a 5-cent fare with a certain percentage paid to the city. It is also possible that the underground conduit system will be tried on some of the downtown streets, though it is not absolutely certain that this will be feasible in Chicago. If it is a success the conduits will require much better drainage than any that has been furnished existing cable conduits in Chicago. Although the present conduits are well drained, there are times when they fill with water, owing partly to the level streets, and partly to overloaded or obstructed sewer outlets.

If the people and City Council of Chicago only realized that it is much more important that franchise questions be settled definitely at an early day, than to wait and haggle over service and equipment, it might help along matters. The companies are only waiting for a definite settlement before putting on the best that money can buy. It must be said to the credit of Chicago, however, that in this discussion and agitation over the franchise matters, the question of first-class service has usually been considered as of more importance than extreme reductions in fare, or large payments to the city in return for franchises.

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Causes and Remedies for Vibration *

BY A. MALLOCK

One usually thinks of a rail as being straight and of a wheel as being circular, but when the profile of the rails and the figure of the wheels are examined with care it is found that this is far from being the case. The rails, even when first laid, are full of hills and valleys, rarely indeed perceptible to the eye, but quite steep enough to cause large vertical forces to act on any mass which has to pass over them at the speed of a train. The wheels also (though nearly circular as they leave the lathe) in the course of use wear irregularly, partly from the action of the brakes and partly from the necessary slipping which takes place in traveling round curves, and perhaps also from want of uniformity in the material. The rail irregularities differ but little in different classes of rails, though the hollows and crests on a "bridge rail" are on the whole rather shorter and steeper than on a "bull-headed rail." The depth of the hollows in both sorts of rails averages about half an inch, but the average distance from crest to crest is from 2 ft. 6 ins. to 3 ft. 6 ins. on the bull-headed rail and 1 ft. 6 ins. to 2 ft. 6 ins. on the bridge rail.

In both classes of rail, however, much deeper depressions and longer-wave lengths constantly occur. The speed with which waves of compression travel in the ground is very large compared with the speed of any train, and waves of distortion, with which we have to deal in the present case, though their velocity is less than that of compression waves, travel certainly not less than 200 miles an hour in clay or gravel.

In addition to the irregularities of the rail which exist whether the train is there or not, rails laid on cross sleepers yield to a variable extent during the passage of a train according as the wheel is just over or between the supporting chairs, and there is some evidence that this variable support tends in a long-used rail to produce an irregularity of the same pitch on the rail surface. In the Central London Railway the rails are laid on continuous sleepers bedded on concrete, and the rails themselves are bridge rails in continuous contact with the sleepers; but the sleeper approaches so closely the flanges of the sections of the tube that

something of the same sort of variable support is given to the rail over the flange on the one hand and over the greater depth of concrete between the flanges on the other. This may cause a permanent irregularity in the rail of the same pitch as the flanges. Owing to the elasticity of the ground and the total load of the train, the latter always travels in a slight depression of its own making.

In connection with the present inquiry I have made observations not only on the vibrations in the ground caused by trains, but also on the like effects due to ordinary road traffic in streets paved with asphalt, wood and granite sets. It was found that every footfall of a horse propagated a wave in the ground sensible for more than a radius of 100 ft. On new wood pavement and on asphalt the waves due to this cause were the only ones which could be distinguished. On granite sets, however, the effect caused by the jolting of the wheels over the successive stones far exceeded, and generally quite masked, the tread of the horses.

When observations are made of the vibrations of the ground caused by trains it is found that although a great variety of periods are present in the motion, nevertheless when the vibrations are largest and most marked the chief component shows a definite period which is nearly independent of the speed of the train, but differs for different classes of line construction. On the Central London Railway, with the rails on longitudinal sleepers and concrete, the frequency is about fifteen per second. These are the vibrations which have given rise to the complaints made by the occupants of houses in the neighborhood of the railway, and the reason of their potency is that most of the floors in good-sized rooms have natural frequencies of the same order of magnitude. The motion of the walls and solid floors of the basements was very small compared with that of the floors of the upper rooms, so small, in fact, that by itself it would probably have escaped notice.

Perhaps the most remarkable thing which the inquiry on the subject of train vibrations has made evident is the extreme smallness of the actual motions which give rise to complaint. The amplitudes of the vibrations in the houses examined rarely exceed a thousandth of an inch, and such an amplitude when the frequency is over ten per second is a genuine source of annoyance. It is true that a single person walking across the floor will set up much larger vibrations, but as far as the occupants of the room are concerned this does not seem to be noticed. The cause of the disturbance is evident, and the motion of the floor ceases when the people cease moving. The vibrations caused by the trains, on the other hand, are most conspicuous when the house is otherwise quiet. An analysis of the experiments showed that it was a matter of chance whether a given locomotive caused a slight or a severe vibration; that trains causing severe vibrations in one house were as likely as not to cause only slight vibrations in the others, and that different rooms in the same house were not similarly affected by the same train. Considering the irregularities of the rails and non-circularity of the wheels, these results are not surprising. There must evidently be a large element of chance in the way in which the non-circular wheel engages with the irregularities of the line, and it will be a matter of chance also whether one, two or more pairs of wheels are in the best position to cause vibrations at the same time.

In August and September last experiments were made on the Central London Railway with a geared locomotive and a multiple-unit train. The geared locomotive (considered merely as a vibration-causing load) differed from the ordinary locomotives of the Central London Railway chiefly in having a much lighter motor working the driving wheels by toothed gearing and in having half the weight of the motor carried on the springs of the bogie frame. This reduced the non-spring borne load to 2.5 tons per axle, as against the 8 tons on the ordinary locomotive. In the multiple-unit train the non-spring borne load is further reduced to about 1¾ tons. The general result of this experiment may be stated by saying that the vibrations caused by the train in the ground decreased in proportion to the non-spring borne load, and that for the geared locomotive they were less than one-third and for the multiple-unit train less than a fifth of what was caused by the ordinary locomotives. The observations of August and September show, I think, conclusively that the ordinary passenger coaches have no effect in causing vibration, for the coaches were practically identical in all the trains, and in the case of the multiple-unit train records it would generally be impossible to say whether a train was passing the vibration instrument or not if it were not for the small group of vibrations which are made by the motors at either end.

It appears, then, that objectionable vibrations can certainly be avoided by reducing the non-spring borne load on each axle to something under 2 tons in the case of a train running at speeds up to 30 miles an hour and on rails laid in any of the usual ways,

* Board of Trade committee report on experiments conducted on Central London Railway.

and no doubt, at present, this is much the simplest procedure. There can be little question, however, that if the surface of the rail could be made nearly smooth, or with only very long and gentle irregularities, much heavier non-spring borne loads might be used without inconvenience, and I think this possibility should not be lost sight of, since if train speeds of 100 miles an hour or more ever become common, it is almost certain that more care will have to be taken in making the surface of the track uniform than is at present found necessary. By the use of rolling stock in which only a small load is constrained to follow the surface of the rail, the remainder being carried on springs, such a general security is attained, and the permissible non-spring borne load is quite sufficient to allow for proper strength and dimensions in the wheels, axles and other parts of which it is made up.

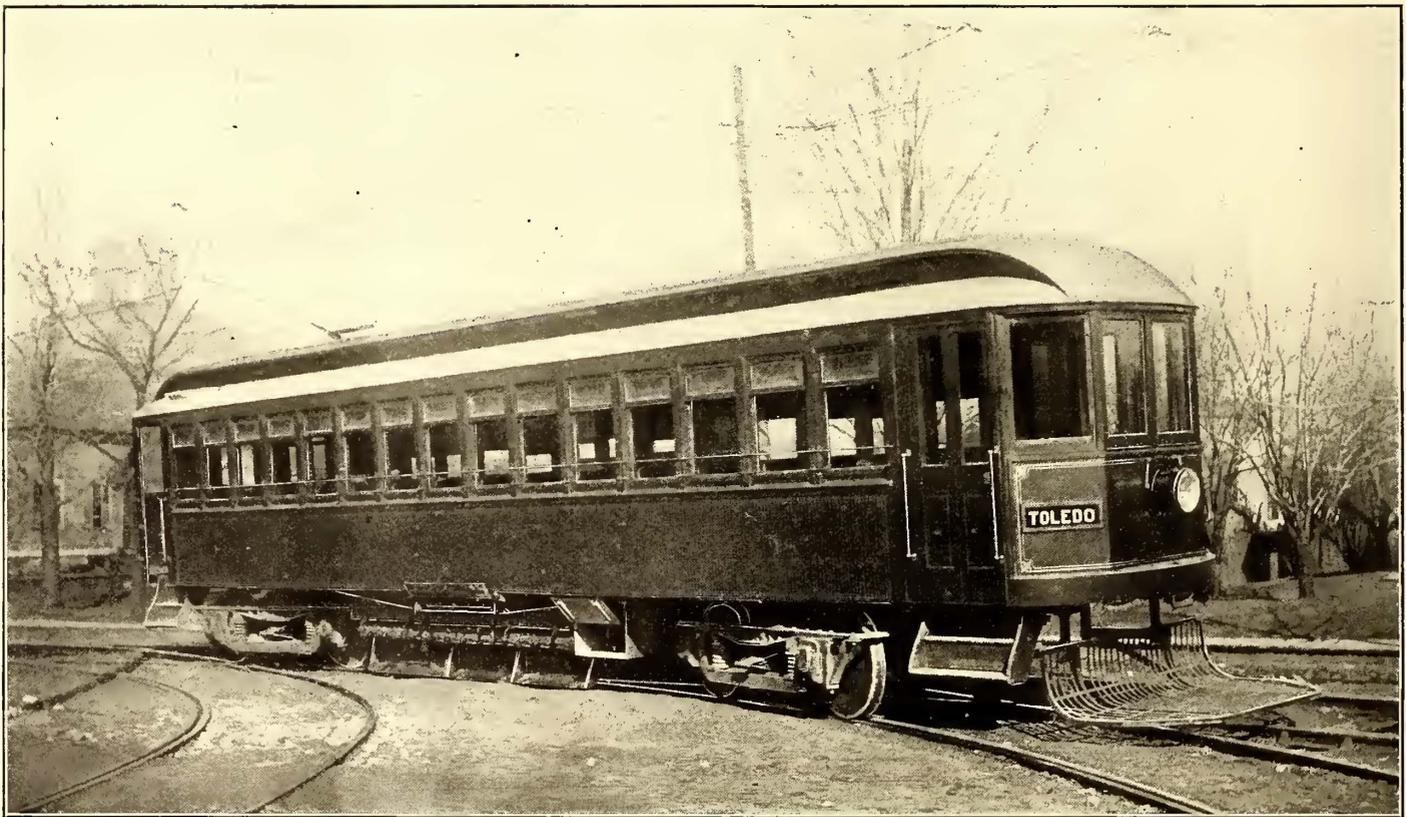
Polyphase Distribution for the North Jersey Street Railway Company

The power facilities of the North Jersey Street Railway Company having become inadequate for supplying the service of this extensive system, it has been decided by the management to install 6000 hp in addition. After considerable thought on the subject, and the advice of outside engineers, the polyphase system of distribution has been adopted and the equipping of the power station on River Street, Newark, with alternating apparatus will commence as soon as possible. The details of the system have not yet been definitely decided, but will probably consist of a 13,200-volt, three-phase distribution, two-phase current being generated by three 2000-hp direct-connected units. There will probably be three substations, one in Orange, one in Montclair and one in Belleville.

steam lines has been brought about by the electric. Passenger travel between Los Angeles and Pasadena and Los Angeles and Santa Monica is now very largely handled by the electric roads, except at the time of special excursions. The Santa Fe Railroad has abandoned its line to Santa Monica. The Huntington Syndicate will soon have electric cars running to Long Beach, and the Los Angeles Traction Company, now building to San Pedro, will run an extension to Long Beach. The Southern Pacific and Salt Lake Railroads, when these lines are completed, will get but little Long Beach, Terminal and San Pedro business. The Redondo narrow gage line is being converted into an electric road, and the Santa Fe Railroad will soon have little occasion to run anything except freight trains to Redondo. San Gabriel, Alhambra, Monrovia and Whittier, and within a short time to Fullerton, Anaheim, Orange and Santa Ana will be reached by the lines of the Huntington Syndicate; and the San Bernardino Traction Company has in operation a line from San Bernardino to Colton and will soon build to Redlands and Highland. Extensions from Colton to Riverside and from Riverside to Corona will probably be built in the not distant future, and the Monrovia line will undoubtedly be pushed east to Azusa, Glendora and Pomona. The sale of the Huntington interests in the street railways of San Francisco resulted in a large sum being placed at the disposal of the syndicate, and it is not too much to assume that practically all of this will be employed in carrying out the syndicate's plans.

High-Speed Electric Trains between Cleveland and Toledo

Mention has been made several times recently of the high-speed tests that are being made by the Lake Electric Railway Company



INTERURBAN CAR WITH CONTROLLER BOXES OPEN

Three conductor cables will be run in underground conduits. Walter A. Pearson, electrical engineer of the Metropolitan Street Railway Company, New York, has received the appointment of consulting engineer and is rapidly perfecting the plans.

Electricity vs. Steam in Southern California

In Southern California, where electric railway development is going on at a rate that few Easterners fully appreciate, the steam lines, especially the Southern Pacific and Santa Fe Railroads, find themselves met with conditions similar to those that confront many of the Eastern roads. The Huntington and various other syndicates that are carrying on the work of building electric lines are pushing operations, and already the abandonment of certain

with a view to determining the possibilities of fast through cars from Cleveland to Toledo, a distance of 118 miles. It is the aim of this company, as soon as the road can be placed in the proper condition, to operate limited cars between the two cities in four hours, which would mean a sustained speed of 29.5 miles per hour, allowing for all stops, and the forty-five minute schedule for 7 miles in Cleveland, and twenty-six minutes for $2\frac{3}{4}$ miles in Toledo.

The car which was used in the trial runs was built by the Barney & Smith Car Company, and is of the following dimensions; Length, 49 ft. 6 ins.; width, 8 ft. 6 ins. It is vestibuled at both ends. This car has seating capacity for fifty-six people. It is divided into two parts—the smoker compartment having eight seats and the coach compartment twenty seats. Baker heaters have been placed in the smoker. The car body is built the same as a steam railroad coach, the windows slide up and the doors swing on hinges, except the rear door and the one leading from the vestibule to the coach,

Details of the New Orleans Consolidation

which slide in partitions. The floors are double and packed with sawdust, deadening all sound. The inside of the car is finished with quarter-sawed oak, the outside is painted yellow, and the seats are upholstered with plush. The trucks were built by the Barney & Smith Car Company with 5 3/8-in. axles and 36-in. wheels. The brakes are of the Christensen straight air type. An Anderson-Smith arc headlight is used. The motor equipment comprises four G. E. No. 66 125-hp motors and a G. E. type C controller connected up for train control. A speed of 65 miles an hour is attained at a pressure of 575 volts. The car requires between 400 amps. and 600 amps. during acceleration, and 260 amps. at full running speed.

During February and March the car was used on the regular run between Norwalk, Fremont and Toledo. Readings taken on the trial runs are given herewith.

The details of the consolidation of the New Orleans City Railway Company, New Orleans & Carrollton Light & Power Company, Orleans Railroad Company, New Orleans Gas Light Company, New Orleans Lighting Company and the New Orleans Railway Company as the New Orleans Railways Company, have been made public. The total capital liabilities of the New Orleans Railways Company will be \$80,000,000. There will be issued \$40,000,000 4 1/2 per cent sinking fund mortgage bonds, \$10,000,000 4 per cent cumulative preferred stock and \$30,000,000 common stock. Of the bonds \$20,000,000 will be issued to acquire securities of existing companies, \$12,846,000 will be reserved to retire existing bonds not provided for under the plan, and \$7,154,000 will be reserved for future ex-

CAR No. 18—ON REGULAR PASSENGER SERVICE

Train	From	To	Distance	Schedule Time	Date.	Watt-Hours	Watt-Hours per Ton Mile	Motorman	Remarks
20	Fifth Street Y	Norwalk	27.54	1 hour 30 min.	Feb. 26, 1902	71,600	74.0	Rudes	Twenty-five stops
10	" " "	" " "	27.54	1 " 30 "	Feb. 27, 1902	66,400	69.3	Jones	" " "
14	" " "	" " "	27.54	1 " 30 "	April 7, 1902	68,400	71.0	Holmes	" " "
23	Norwalk	Fifth Street Y	27.54	1 " 30 "	Feb. 26, 1902	58,000	60.4	Rudes	Thirty stops
15	" " "	" " "	27.54	1 " 30 "	Feb. 27, 1902	55,300	57.9	Jones	" " "
19	" " "	" " "	27.54	1 " 30 "	April 7, 1902	69,200	71.9	Holmes	" " "
23	Fifth Street Y	City limits	30.72	1 " 37 "	Feb. 26, 1902	66,800	61.9	Sandwich	Left Fifth Street 15 minutes late
21	" " "	" " "	30.72	1 " 37 "	Feb. 28, 1902	75,600	70.6	" "	" " " 10 " " "
1	" " "	" " "	30.72	1 " 37 "	Feb. 27, 1902	56,000	52.1	Jones	" " "
5	" " "	" " "	30.72	1 " 37 "	Mar. 28, 1902	63,200	59.0	Holmes	" " "
5	" " "	" " "	30.72	1 " 37 "	April 7, 1902	85,600	79.2	" "	" " "
23 and 32	City limits	" " "	5.48	0 " 46 "	Feb. 26, 1902	24,600	128.2	Sandwich	Time slow; many stops on acc't city cars
1 and 10	" " "	" " "	5.48	0 " 46 "	Feb. 27, 1902	24,400	127.5	Jones	" " " " " "
21 and 30	" " "	" " "	5.48	0 " 46 "	Feb. 28, 1902	21,200	111.0	Sandwich	" " " " " "
5 and 14	" " "	" " "	5.48	0 " 46 "	Mar. 28, 1902	26,800	140.0	Holmes	" " " " " "
5 and 14	" " "	" " "	5.48	0 " 46 "	April 7, 1902	34,000	178.0	" "	" " " " " "
34	" " "	Fifth Street Y	30.72	1 " 37 "	Feb. 26, 1902	40,000	37.2	Sandwich	" " "
10	" " "	" " "	30.72	1 " 37 "	Feb. 27, 1902	70,000	65.1	Jones	" " "
32	" " "	" " "	30.72	1 " 37 "	Feb. 28, 1902	49,600	45.2	Sandwich	" " "
14	" " "	" " "	30.72	1 " 37 "	April 7, 1902	68,400	71.0	Holmes	" " "
19	Norwalk	" " "	27.54	1 " 30 "	Mar. 28, 1902	68,800	71.6	" "	" " "

On Washington's Birthday the car took the night theater run from Fremont to Toledo and return, and accomplished one of the fastest runs ever made by an electric car in this country. The loaded car weighed 36 tons, and with a clear track the distance of 33.16 miles was covered in 1 hour 11 minutes and 10 seconds on the down trip and 1 hour and 10 seconds on the back trip, an average of 34.3 miles per hour on the down trip and 35.3 miles per hour on return trip. From Fremont to the Toledo city limits, 30.42 miles, the time was 52 minutes and 10 seconds, and on the return trip 44 minutes and 30 seconds, the former an average of 41.2 miles, and the latter an average of 41.85 miles per hour. It will be noticed from the accompanying table marked "theater run," that when the car was making its highest speed the watts per ton mile were practically equal to the speed in miles per hour. The current consumption within the city limits of Toledo where city cars were in operation, and where there were many bad curves, was about three times as great as on a straight level track and with less than one-fifth the speed. The increase of current consumption caused by grades and curves is also marked.

The car is now being used for regular runs on the Lorain and

tensions and repairs. The exchange of securities will be made on the following basis:

New Orleans City Railway Preferred Stock—Each \$1,000 will receive \$1,125 in cash or new securities, as follows: \$865 of bonds, \$432 of preferred stock and \$865 of common stock. New Orleans City Railway (common stock)—Each \$1,000 will receive \$350 in cash or new securities, as follows: \$269 of bonds, \$134 of preferred and \$269 in common stock.

New Orleans & Carrollton Light & Power Common Stock—Each \$1,000 will receive \$950 cash or new securities, as follows: \$730 of bonds, \$365 of preferred stock and \$730 of common stock. New Orleans & Carrollton Light & Power (preferred stock)—Each \$1,000 will receive \$1,050 cash or new securities as follows: \$807 of bonds, \$403 of preferred stock and \$807 of common stock.

Orleans Railroad Stock—Each \$1,000 will receive \$1,600 in cash or in new securities, as follows: \$1,230 of bonds, \$615 of preferred stock and \$1,230 of common stock.

New Orleans Gas Light Stock—Each \$1,000 will receive \$1,250 in cash or new securities, as follows: \$961 of bonds, \$480 of preferred stock and \$961 of common stock.

New Orleans Lighting Company Stock—Each \$1,000 will receive \$600 in cash or new securities, as follows: \$461 of bonds, \$230 of preferred stock and \$461 of common stock.

CAR No. 18—THEATER RUN; LOADED WEIGHT 36 TONS

From	To	Total Time	Time Out	Actual Running Time	Distance	Number of Stops	Watt-Hours	Watt-H'rs per Ton Mile	Watt-H'rs per Car Mile	Speed in M.P.H.	Remarks
Fremont T. O.	Hessville	h. m. s.	m. s.	m. s.							
		0 19 50	5 40	14 10	8.51	4	27,200	88.7	2195	36.0	One 7% grade 600 ft. long; 3 railroad crossings
	Siding No. 20	0 4 15	-----	4 15	4.84	--	11,600	66.6	2397	67.0	Straight, level track
Siding No. 20	Siding No. 14	0 8 35	-----	8 35	5.62	--	16,000	79.4	2854	39.4	One 3% grade 1500 ft. long; 4 curves
Siding No. 14	Toledo city limits	0 19 30	2 10	17 20	11.45	1	27,000	65.5	2354	39.6	Block set against at L. S. & M. S. R. R.
Toledo city limits	Toledo T. O.	0 19 0	5 0	14 0	2.74	7	17,800	110.0	6480	11.8	Interference with city cars
Toledo T. O.	Toledo city limits	0 15 40	2 40	13 0	11.45	7	19,200	195.0	7010	12.7	Many bad curves
Toledo city limits	Siding No. 14	0 17 50	-----	17 50	11.45	--	28,200	68.5	2465	38.5	Eight miles, 350,000 cm feed
Siding No. 14	Siding No. 20	0 8 30	-----	8 30	5.62	--	19,200	95.1	3420	39.8	Four curves
Siding No. 20	Hessville	0 4 10	-----	4 10	4.84	--	12,000	69.0	2480	69.0	Straight, level track
Hessville	Fremont T. O.	0 14 10	0 55	13 15	8.57	2	24,200	79.2	2848	38.6	Three railroad crossings
Fremont T. O.	Toledo T. O.	1 11 10	12 30	58 20	33.16	11	99,600	83.6	3010	34.3	
Toledo T. O.	Fremont T. O.	1 0 10	3 35	56 35	33.16	9	102,800	86.2	3105	35.3	
Fremont T. O.	Toledo city limits	0 52 10	7 50	44 20	30.42	4	81,800	75.1	2700	41.2	
Toledo city limits	Fremont T. O.	0 44 30	0 55	43 35	30.42	2	83,600	76.7	2725	41.85	

Cleveland division of the road. It was expected that a much better showing would be made on this division, which is wholly on private right of way, with few curves and grades, and no grade crossings, but on account of insufficient power it has been found impossible to do as well. However, with the proposed additions to power equipment and the general improvement of the new division of the road now under way, the management is convinced that the large cars will be able to make the through Cleveland-Toledo run on the proposed schedule for limited cars stopping only in the large towns.

New Orleans Lighting Company Bonds—Each \$1,000 will receive \$1,100 in cash or new securities, as follows: \$846 of bonds, \$423 of preferred stock and \$846 of common stock.

New Orleans Railways Bonds—Each \$1,000 will receive \$1,050 in cash or new securities, as follows: \$807 of bonds, \$403 of preferred stock and \$807 of common stock.

The annual meeting of the stockholders of the General Electric Company was held at Schenectady May 13. The principal business was the election of thirteen directors, the old board being re-elected. About 185,000 shares of stock were represented.

Policemen and Street Railway Companies

The decision of the Appellate Division at Albany on May 7, declaring that policemen and firemen could not accept free transportation on street railway lines, was briefly summarized in last week's issue, but the scope and bearing of the ruling does not seem to be fully understood by the daily press and many of the street railway managers of the State. The attitude of the United Traction Company of Albany, and the controversy between that corporation and the city administrations of Troy and Albany, which led up to this litigation are clearly explained in the following statement which is authorized by President John W. McNamara, of the United Traction Company of Albany:

PRESIDENT McNAMARA'S STATEMENT

"Section 5 of article 13 of the constitution of New York was a new provision adopted by the last constitutional convention for the purpose of preventing the abuse of passes, and bribery and corruption by means thereof. After the amended constitution went into effect, the Legislature passed chapter 417 of the laws of 1895, which provided that the mayors of cities and the presidents of incorporated villages might issue certificates to policemen and firemen, and that all railways in cities and villages should recognize the certificates and permit the holders thereof to ride without the payment of fare. Immediately after the passage of the act, the mayor of the city of Albany requested the Albany Railway, which was the company then operating street railways in the city of Albany, to accept such certificates in lieu of fare. We contended that the law was unconstitutional, and that we would be guilty of a misdemeanor in permitting policemen and firemen to ride without the payment of fare, for the reason that it would be in violation of section 5 of article 13 of the constitution. We submitted the question to our counsel, Rosendale & Hessberg, and after an exhaustive examination, they emphatically decided that our contention was right.

"When the United Traction Company was formed we found that the Troy City Railway Company had been acknowledging the certificates of the mayor of Troy issued to policemen and firemen, and we at once gave notice that we would not continue to carry them, for the reason that it was contrary to the constitution. All went well until the beginning of the present year, when there seemed to be a concerted action in the cities of Albany and Troy to force the United Traction Company to acknowledge the validity of the law of 1895, and the matter was taken up by the Common Council of the city of Albany, and by the mayor of Troy. We adhered to our former decision, which seemed to be accepted by the Common Council of the city of Albany, but was not acquiesced in by the mayor and administration of the city of Troy. The mayor, in pursuance of his plan to force us to acknowledge his certificates, issued several to policemen, who presented them to our conductors. Our conductors, acting under instructions, declined to permit the holders thereof to ride without the payment of fare, and after requesting the policemen to pay fare or leave the car, proceeded to eject the policemen. We were all surprised to find that the policemen had received instructions from the commissioner of public safety to arrest all conductors who attempted to eject them from our cars. Three arrests were made the first day, which, of course, interfered seriously with the operation of our road, inasmuch as the cars were left standing upon the tracks without conductors. We offered to submit the controversy to the Appellate Division, but the city administration declined or neglected to do so. The result was that the next day more than twenty of our conductors were arrested for refusing to carry policemen free. These arrests were made between the hours of 6 p. m. and 8:30 p. m., just at the time when the cars were crowded with people going to their homes after the day's work. There was nothing for us to do except to consent to accept certificates in lieu of fare, under protest, which we did.

"The authorities of the city of Albany were encouraged by what seemed to be the success of the Troy administration, and at once issued certificates to a fireman and a policeman, and gave them special instructions as to their use. Both boarded the same car and were promptly ejected by the conductor. The policeman did not attempt to follow the example of the Troy policemen, but reported his action to the Corporation Counsel. We at once made the same offer to the Albany authorities that was made to the Troy administration, and were agreeably surprised to find that it met with favor. The result was a test case, the argument followed within a few weeks after submission, and the decision sustaining our position and declaring chapter 417 of the laws of 1895 unconstitutional was handed down May 7."

ATTITUDE OF OTHER MANAGERS

In New York and Brooklyn street railway officials deprecated the court's ruling on the ground that the policemen's presence on the street cars had a restraining influence upon the lawless element,

especially pickpockets, who plied their trade during the rush hours. The following statement summarizes this position:

"Heretofore we have considered policemen and firemen as a protection to the traveling public, and we regret that they are not to be allowed to ride free, because they were formerly able to accomplish decided results. A considerable number of pickpockets and petty thieves ride on the street cars as a regular practice and rob the passengers in transit, especially the women. The police detailed men in plain clothes to look out for them, and arrests were made by the hundreds every year. So far as we are concerned, the interpretation of the words 'public officials' to include policemen and firemen will merely result in giving us more fares. But we were always glad to pay that tax for the sake of the added security of our passengers."

The managers of one large system said that instructions would be given the conductors not to ask policemen and firemen for fare, but in case payment was tendered to accept it. All of the companies signified their intention to comply with the requirements of the law.

One company up the State has come to the conclusion that it is not affected by the ruling, as its franchise provides that it shall carry policemen and firemen free, as part payment for the privileges granted by the city.

JUDGE PARKER'S DECISION

The decision in the Beardsley case, 162 N. Y., 230, which follows the decision of the Federal Court in *Lake Shore & M. S. Railway Company vs. Smith*, 173 U. S., 684, seems to be a clear authority for the proposition, that the statute of 1895 operates to deprive the defendant of its property without due process of law. In those cases the railroad companies were required to issue mileage books at a reduced rate of fare, to those willing to purchase a designated number of miles at one time. In this case, the defendant is required to carry a certain specified class of persons entirely free of charge. If the former is an invasion of the companies' property rights, the latter is equally so; and in neither case is there any process of law provided for, save the mandate contained in the act itself. It is sufficient to refer to the reasoning of the court in those two cases, to show that the principles which controlled in them are equally applicable to this case. They are substantially alike in all respects, save as to the single question whether the act of 1895 can be sustained as a legitimate exercise of the so-called police power of the State. If it may not be sustained upon that theory, then, like the mileage book law, it is a clear violation of that provision of the constitution, that no person shall be deprived "of life, liberty or property without due process of law, nor shall private property be taken for public use without just compensation."

There are certain lines of legislation which are sustained, although they do injuriously interfere with property rights and even confiscate them, without due process of law; but it is for the reason that they are necessary to promote the health, morals or safety of the public. Just how far such legislation may extend, it is not easy to define in any general statement. The methods which the Legislature may adopt to guard such interests, the courts do not attempt to regulate, except as the cases arise and are presented to them; but, in such cases, they are "careful to detect violations of constitutional safeguards masquerading in the garb of police powers."

An extended discussion of those powers and their extent is not necessary here. One may be found in the case of *Bronk vs. Barkley*, 13 App. Div., 72. It is sufficient to say, that, in our judgment, the statute in question cannot be sustained as a valid exercise of that power. Its evident purpose and effect is to relieve the municipalities referred to therein, from a portion of the burden of maintaining their police and fire departments, at the expense of the several street railway companies within their limits. Concede that the public safety requires that the public officers mentioned be carried upon such railroads, it is not apparent why, in order to promote that safety, they should be carried free of charge. There is no pretense that the act is necessary to secure their right to ride upon such roads. The sole purpose is to secure their right to ride free. Thus the only advantage secured by the act to the public is, that the railroad company, instead of the municipality pays the fare. Such an advantage may be a public convenience; but the right to take the property of the individual citizen, or of a class, for the sole reason that the proceeds of it would be convenient to aid the municipality in defraying its general expenses, has not yet been conceded as a legitimate exercise of the police power, and we are not disposed to concede it now. This conclusion renders it unnecessary to examine the other questions raised in this case. The statute being a violation of the constitutional protection above referred to, it is inoperative as against the defendant. The plaintiff's claim to ride free was, therefore, without warrant, and judgment should, therefore, be rendered against him and in favor of the defendant for costs.

Selection of Street Railway Motor Equipment

BY FRED A. JONES

A careful study of the conditions in the street railway field to-day leads me to make the following statement of efficiency of the power equipments: Fifty per cent of the electric roads of the United States are consuming at least 40 per cent more power than is necessary to operate their cars and make their schedules; another 25 per cent are consuming 20 per cent more power than is necessary; 15 per cent are using 10 per cent of needless energy, having only 10 per cent of the systems operating on the best possible economy; this condition opens a vast field for effecting a saving in cost of operation of the majority of railway systems if only this one item of saving in energy, by reason of adaptability of equipment, is considered. Besides the saving in energy consumption, by reason of the nature of equipments, there are other problems of expense constantly before the street railway superintendent that I shall not attempt to treat; among these might be mentioned cost of labor and maintenance, and under these items would come the arrangements for handling at the car house, the economy of the power plant, the difference in fuels, closeness of inspection and the energy loss in the line, as well as the rail-bonding, etc.

My subject deals only with the railway motor equipment, and what should be considered when making its selection. In the first place, the rating of the railway motor is a matter of temperature; the horse-power is purely nominal and really indicates a commutating capacity of the machines. It means that if the motor is placed upon the stand and run at a current and voltage necessary to give its rated horse-power for one hour the temperature rise will be about 65 degs. C. A motor on any railway service, if the cycle of events is steadily repeated, has a certain fixed rise in temperature, with small variations from this temperature. For example, if we have a 10-ton car, making a round trip of 5 miles in thirty minutes, with an average of five stops per mile, and including five minutes in layovers, and each stop an average of ten seconds in duration, and the average passenger load is included in this 10 tons, then, for a certain motor, with a certain gear and pinion, there would be a certain rise in temperature, which can be correctly calculated by knowing the characteristics of the motor. As you well know, the smaller the pinion the lower the speed of the equipment, and the larger the pinion the higher the speed; for the distance between centers of gear and pinions cannot be changed for any one motor design; so that with any motor low or high speed gearing may be furnished, and as a matter of fact eight or ten different sizes of gears are manufactured for each standard motor by the large companies. The speed of a motor may also be increased by decreasing the number of turns per coil of the armature. Thus we have one-turn, two-turn, three-turn, four-turn, five-turn and six-turn machines, and a few with even a greater number of turns. Very large motors have only one turn per coil when used for elevated railway service. Each manufacturing company gets out a line of railway motors ranging from 20-hp to 250-hp rating, and each size of motor may have different-sized pinions and gears, and a different number of turns per coil in the armature; so that in making a selection of the proper motor equipment to handle any service we have three hundred or four hundred different equipments to select from. Some of the best engineers have specified a high maximum speed for every condition that would stand it. This necessitates high-speed gearing, which means a lower tractive effort; that is, a greater current is required for obtaining the same tractive effort with high-speed gear than with a low-speed gear. Where the stops are few, for example once every 2 miles, as in interurban or suburban service, this may not be so important, but in heavy city service, where the stops are six or seven per mile, for low energy consumption, the equipment must be low-speed, and at the same time nothing is lost in time, for the low-speed equipment will accelerate more rapidly than the high-speed equipment.

There is a method of representing pictorially the service conditions of any railway line, and this is called a service characteristic. It is based upon the fact that a motorman will repeat the same cycle of events very closely in going over the same ground and in the same time. If we represent as abscissa, or in a horizontal direction, time, and as ordinates, or in a vertical direction, speed, and plot the cycle of a car from start to stop, first accelerating and then running on the motor curve, free-running at a uniform rate, coasting and then breaking, we can draw this service characteristic and the area of the figure will be the distance covered.

Thus, by going over a service, averaging the distance between stops and the time per stop, taking the number of passengers at 10 o'clock in the morning, about the lightest service, and 6 o'clock in the evening, about the heaviest service, and thus getting the aver-

age load, if necessary dividing the line up into sections, especially where part of the running is in the city and part suburban, we might get very closely to the conditions of operation.

Now it is very important that the temperature rise of the motor shall not be excessive. It is estimated that if rise in temperature is 100 degs. C. the motors will begin to burn out after one year's service, and will give probably a great deal of trouble the first year. If the temperature rise is 90 degs. the probabilities are that no trouble will be experienced the first year, the second year there will be some trouble, and the third year new coils will probably be required for all the motors. With 65 degs. rise the motor should last seven years. It is very important, therefore, that the rise in temperature should not exceed this amount, and it is wise to determine the expected rise before the motor is bought. This may be done very closely by having each motor tested over a wide range of service and the temperature accurately taken. It is not probable that any service condition in practice will be identical with the conditions of one of these tests, but this is provided for in the following manner: If the degree rise is divided by the number of watts lost in the field, and also by the number of watts lost in the armature, we get a series of values giving degree rise per watt lost for both field and armature for different ratios of distribution of losses. The ratio of distribution means the watts lost in the armature divided by the watts lost in the field, and for every service there is a certain distribution of losses to be expected. The armature loss of the motor is made up of the core loss (which includes the eddy currents in the iron and copper), and the $C^2 R$ loss, C representing the current through the armature and R the resistance of the armature. The field loss is entirely a $C^2 R$ loss, the current of the field being the same as that of the armature, as railway motors are series motors, but are representing in this case the resistance of the fields.

Now, if by our analysis of the service conditions we can determine the ratio of distribution of the losses to be expected from the tests of the motor itself, we can determine the temperature rise, and this rise can be determined within three or four degrees. The motor that has high core loss cannot be used for high-speed work and long distances between the stops, for the core loss increases with the speed, but it is not so essential to have low core loss for a large number of stops per mile.

The best motor for interurban work is one with high resistance and low core loss; for city work low resistance and as high core loss as is necessary. It is not possible to reduce the core loss below a certain point, for in intermittent work low armature reaction and high flux are necessary, and with high flux comes naturally high core loss.

I have tried to point out how the question of temperature primarily affects the selection of the equipment. Almost as important is the question of energy consumed, which is generally calculated in terms of watt-hours per ton mile. The watt-hours per ton mile for a fourteen-tooth pinion would be less than for a seventeen-tooth pinion, using the same motor and making the same schedule, with all other conditions the same, but the maximum speed would be less, and it might be that not quite as fast a schedule could be made by it. If it is possible to make the desired schedule, however, with a fourteen-tooth pinion, it would be preferable to do so in spite of the fact that it would not give as high maximum speed as would be reached on a level. One of the elevated railway companies in the North could undoubtedly save 10 per cent of the money expended for power by reducing the number of teeth of their pinions and still make the same schedule that they are now making.

I will close with an explanation of what is proposed by the two largest electrical manufacturing companies in regard to approximating service conditions in making tests on railway motors.

The Westinghouse Company proposes to run at such a voltage and current as will give the losses met with in practice with the motor mounted upon a stand. This is undoubtedly the most convenient method of testing, but I do not believe it approaches near enough to service conditions; and the method of the General Electric Company, of actually running the motors at a voltage at which they will be used in practice on the experimental railway, and obtaining in this manner the motor characteristics, seems to me to approach nearer the absolute conditions in practice. I know from experience that there is a difference in the way the motor acts when stationary and when on a car, and that these differences extend to ventilation, heating and general operation.

* Read at the convention of the Southwestern Gas, Electric and Street Railway Association, San Antonio, Tex., April 18-21, 1902.

The government of India is considering a project for establishing an electric railway 200 miles in length in the area watered by the rivers Ravi, Sutlej, Chenab and Jhelum, tributaries of the Indus. Within the district of the proposed line there is said to be available water-power of no less than 5,000,000 hp. A rough survey has already been made of the proposed route.

Referee's Report on Special Franchise Tax Law

Public service corporations throughout New York are interested in the latest development in the legal controversy over the enforcement of the terms of the special franchise tax law passed by the Legislature in 1899, but never generally enforced because of opposition of many of the companies affected. At Albany on May 8 the law was declared constitutional and workable by Robert Earl, a former Chief Judge of the Court of Appeals, as referee, appointed by Supreme Court Justice D. Cady Herrick about a year ago as a result of an attack upon the law by the big street railroad and gas and electric light corporations of New York city. Judge Earl was appointed referee to take the evidence in thirty-eight applications for writs of certiorari to review the action of the State Tax Commission in valuing the special franchises of the New York city corporations, upon the ground that the law was unconstitutional; that it was unworkable and could not be enforced; that it violated the Constitution in directing the State instead of the local assessors to value the special franchises, and that the method pursued by the State Tax Commission in assessing these franchises was illegal. Referee Earl in his report upholds the constitutionality and workability of the law and declares against every contention raised by the attorneys for the corporations, except one. The State Tax Commission, in valuing special franchises as real estate, assessed them at their full value, and in this made a mistake, as no county in the State assesses real estate at full value. For instance, in Albany County it is assessed at 78 per cent of full value, in New York County at 67 per cent, in Kings County at 68 per cent, in Queens County at 80 per cent, in Richmond at 66 per cent, and in Westchester at 90 per cent. The referee says that in his findings, which will be announced later, he will scale the valuations fixed by the State Tax Commission of special franchises, so that they will bear the same relation to full value as is now practiced in the different counties by the local assessors in assessing real estate. For instance, the Metropolitan Street Railway was assessed at full value, the amount being \$70,100,940. Under the referee's findings the total valuation will be on a 67 per cent basis, or \$46,967,930, and so will the other valuations of special franchises in New York city and throughout the State be cut down in accordance with the local ratio of assessing real estate toward full value. The State's attorneys for the last two years, have conceded that special franchises should not be assessed at full value, but at the percentage of local value adopted in the different counties in assessing real estate. Upon such a basis the Attorney-General's department has, during the last year, reached an agreement whereby the corporations in Buffalo, Rochester and Albany and the telephone and telegraph companies in New York city have paid their taxes under the special franchise tax law. The referee's conclusions are that "there is not, by this franchise tax act, such a clear violation of the home-rule provisions of the State constitution as authorizes any court to pronounce it invalid on that account;" that it does not violate the Federal Constitution by impairing the obligation of contracts; that the act is practicable and workable; and that there is nothing in the general objections to the assessments made under it to show their illegality or invalidity.

The amount of the assessment involved in these proceedings is said to be \$137,000,000. Forty millions of this is property which, under the old regime, was taxed by the local assessors. The total property of this character throughout the State in 1900 was valued above \$266,000,000. The amount of real estate as distinguished from the franchises contained in this amount exceeds \$100,000,000.

Three years' taxes are now due, and it may be five years more before the litigation is finished, as the companies propose to take the case to the Supreme Court of the United States. The valuation of the property affected, if it should take this course, would exceed \$2,000,000,000; and the tax involved would be upward of \$40,000,000. The principle involved interests other States which have tried or are desirous of levying similar taxes on corporations.

The State Tax Commission made public the valuation placed on the special franchises of the larger corporations in Greater New York. These figures were prepared in accordance with the decision, and the assessment in New York County will be on 67 per cent of the total valuation placed on the franchises. For Kings County the assessment will be on 68 per cent, and for Queens County on 80 per cent. The table shows the complete valuation upon which the large railway companies will be assessed at the tax rate fixed by the New York Tax Commission:

Companies	Valuation
Brooklyn Rapid Transit System.....	\$15,794,020
Manhattan Railway Company.....	29,882,335
Metropolitan Street Railway System, including Third Avenue Railway	46,967,930
Concerning the report of Referee Earl in the franchise tax	

cases, President Vreeland, of the Metropolitan Street Railway Company, said:

"It is to be borne in mind that the referee's report is not a judicial decision. Judging by the way things have gone since this litigation began, we are still all of five years away in point of time from the final settlement of the case. The referee's report will now go to the Supreme Court, and there the issue will have its first court trial, and the decision there will be the first judicial interpretation of the law. Beyond that point is the Appellate Division, and then the Court of Appeals, and the Supreme Court of the United States, for, it must be remembered, Federal issues are involved.

"Speaking for the Metropolitan Company, our objection to the law is not so much on account of the actual injustice done as of the possible injustice. We do object to increased taxation, but we especially object to a law the terms of which are indefinite, enabling valuations to be guessed at and opening the door to imagination and prejudice. That portion of the referee's report which deals with the method by which the law is to be administered gives us a substantial victory by decreeing that the amount of tax as levied shall be reduced one-third. This large reduction, together with the other reductions, even larger in amount, resulting from the substitution of this tax for certain other taxes now being paid, makes a net result of additional taxation very much less than is commonly supposed. The so-called franchise tax takes the place of all the other taxes now being paid to the city (except the tax on real estate). We now pay to city, State and county approximately \$1,000,000 a year. Nominally the law now being tested imposes an additional million. But the referee's report cuts that down one-third, and there will then be deducted the amount of the existing local taxes, so that the net result to our company, instead of being an additional tax of a full million, will be an additional tax of no more than \$300,000. This is \$300,000 too much, and no franchise tax is fair that is not a specific tax on income, and we shall exhaust the remedies provided by law before we submit to what we believe is unjust and wrong in principle. It is not so much the net amount of additional tax to result from this law of which we complain, as it is the possible wrongs that may be perpetrated under its provisions."

Philadelphia Deal Completed

On May 5, at a special meeting of the stockholders of the Union Traction Company, which controls all of the street railway lines in Philadelphia, resolutions were adopted favoring the lease of the company's franchises to the Philadelphia Rapid Transit Company and empowering the officers to execute the lease, which becomes operative July 1. Of the 600,000 shares of the company, 442,623 were voted in favor of the project. Another resolution was adopted empowering the directors to issue \$1,500,000 fifty-year 4 per cent collateral gold bonds to fund the company's debt. The lease is for a period of 999 years. The Philadelphia Rapid Transit Company is capitalized at \$30,000,000, having 600,000 shares of the par value of \$50, 10 per cent to be paid in, and was incorporated about a week ago by J. Edward Ryan, William E. Slack, W. T. C. Sanders, James L. Brustar and Albert Jefferies, of Philadelphia.

Improvements at Indianapolis

The Indianapolis Street Railway Company has announced that it will spend about \$500,000 in new equipment, new buildings and extensions, and building of lines during the summer and fall. Much work will be done in rebuilding new lines and constructing extensions, and considerable track material has already been purchased. Probably the most important work contemplated by the company is the construction of two new car houses. One of these buildings will be erected in connection with the houses in Louisiana and McClain Streets, and the other will be built in Washington or West Street. The Louisiana Street power house will be abandoned to make room for one of the new car houses. Important additions will be made to the equipment of the Washington Street power house. A 2000-hp engine and a 1200-kw generator are to be added to this plant.

Funeral Cars to be Operated in a Cemetery

The owners of Lake View Cemetery, Cleveland, have granted permission to the Cleveland Electric Railway Company to build a track into the cemetery for the operation of the company's funeral car, the use of which is rapidly growing in popularity. The company will endeavor to lay tracks in all cemeteries to which its lines operate.

Legislative Doings in Massachusetts

Governor Crane, of Massachusetts, has signed a bill regulating issues of stocks and bonds by street railway companies to pay for extensions without an appraisal of the whole property. This puts the law as to street railway companies substantially on the same basis as that for steam railroads, so far as Massachusetts is concerned. A bill is still pending before the street railway committee of the General Court to permit the Railroad Commissioners to employ experts for the purpose of making appraisals in this particular, and it will undoubtedly be reported favorably and pass the House and Senate.

The committees on railroads and street railways, sitting jointly, have reported to the Legislature a bill, based on the recommendations of the governor, to provide for the expenditure of \$5,000,000 in addition to that already expended by the Commonwealth for the elimination of grade crossings. Under the provisions of this measure the street railway companies are brought in as a fourth party in the payment of the expense, the maximum proportion of each being as follows: Sixty-five per cent for the railroad companies, 15 per cent for street railways, 10 per cent for municipalities, and the balance to be paid by the Commonwealth.

Under provisions of the bill street railway companies are permitted to issue stock and bonds to meet this expenditure, which is to become a part of the cost of their plants. Section 8 of the bill, as reported, provided that in cases of grade crossing separation now in progress in the courts where no decrees had been filed, the attorney-general may be authorized to ask the court to dismiss the petition, that a new one may be brought, which shall include the street railway companies. This bill is now before the committee on ways and means of the House. The committee complied with the request of the people of New Bedford and Haverhill to strike out the eighth section, because in New Bedford a large amount of money and many years of time have been spent in preliminary work, which might be all upset if the petition were now dismissed. The section would also apply to the city of Worcester, where grade crossing elimination work is in progress; but it is not understood that the Worcester people object to this provision.

The General Court has resolved to provide for an investigation by the Railroad Commissioners as to the feasibility of the use of automatic brakes on street railway cars, and has also resolved that an investigation be made as to the feasibility of equipping all street railway cars with lifting jacks for use in case of accident.

The committees on railroads and street railways, sitting jointly, have spent a great deal of time in consideration of the petition to provide that railroad corporations may purchase and vote on the stock of street railway companies. The bill which is pending provides that a railroad company may, after it has purchased two-fifths of the stock of a street railway company, appeal to the Railroad Commissioners, who shall fix the price to be paid for the remainder of the stock, which may then be brought to the railroad company by the stockholders. The proposition was put to vote, and the first canvass resulted in a tie, there being 12 yeas and 12 nays; while on the latter date, the vote was 10 to 10. A full canvass of the two committees shows, however, that they stand 18 against to 12 in favor. On May 13 the committee reported reference to the next general court.

A petition is pending to provide that the Grafton & Upton, the Milford & Uxbridge, and the Milford, Hilliston & Framingham street railway companies may carry mail, act as common carriers, etc. This measure is peculiar in that it provides for a union of a steam road with street railways, and the plan is, in case it goes through, that the old steam road shall be used simply for freight carrying purposes, while passengers will be carried on a combination of electric railways with the steam road which may build a few miles of electric track. Should the bill which provides for the purchase of stock of street railway companies by railroad corporations become a law, the bill of the Grafton & Upton, the Milford & Uxbridge, and the Milford, Hilliston & Framingham Companies would not be necessary. However, the indications are that it will be favorably reported by the street railway committee in any event.

Two bills at present lie upon the table of the Senate, one being a bill to require street railway companies to pay a part of the cost of building or repairing bridges upon highways upon which they have locations, and the other being a bill to require street railway companies to pay a part of the cost of improving highways upon which they have locations. Although these bills were favorably reported by committees, one by the committee on counties and the second by the committee on street railways, the probability is that neither will be enacted into law.

The special committee on the relations between street railway

and municipal corporations has favorably reported a bill to give the Railroad Commissioners authority to approve all locations of street railway companies in any part of the Commonwealth. A law is now in force providing for such approval of locations in Boston, Cambridge and Brookline. There was a very brisk debate upon this matter on May 6 in the House, and finally a point of order was raised against the bill, that as it involved the expenditure of State funds, it should have gone to the committee on ways and means as a matter of secondary reference, and the measure was tabled to await a ruling upon it. This point is not regarded as of particular consequence, but the temper of the members indicated that the bill might not become a law.

Two innovations in the relations of street railways and municipal corporations have come in this year, one being a bill before the committee on cities to provide that the city of Pittsfield may grade and pave streets, etc. This measure contains the antiquated provision that formerly existed in some city charters that street railway companies may be compelled to pave between their tracks and for 18 ins. outside. The Massachusetts Street Railway Association is opposing this measure, because it is directly in conflict with the street railway law of 1898, which eliminated all such provisions from the statutes, substituting an excise tax. The Massachusetts Street Railway Association argues that it is very unfair for any city in the State to ask legislation which will compel the street railway companies to bear such a burden as this in addition to the tax, which is supposed to offset the paving obligation.

A measure from the committee on cities, which provided for the revision of the charter of Fall River, is up for consideration. The fourteenth section contained a provision that no franchise granted to a street railway or other public service corporation should extend for a longer period than twenty-five years, and that this period might be shortened. As the work of the special committee which drafted the street railway law of 1898 was particularly devoted to securing more permanent franchises rather than limited franchises, it was quickly seen by the House that this charter amendment was in conflict therewith, and consequently the section was eliminated from the bill. By an odd circumstance this charter had its hearings by the committee on cities, and was reported before any member of the committee or any representative of the street railways discovered the section referred to. It is the custom in Massachusetts when a charter revision is before a committee to make the work rather perfunctory, as it is subject to acceptance by the people in any event, and doubtless this was the reason that the provision escaped the notice of all interested parties.

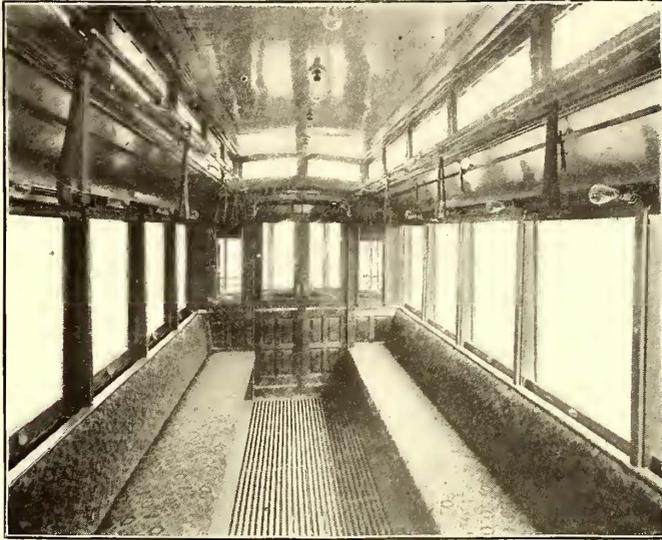
The Everett-Moore Situation

Despite the repeated reports that the bankers' committee in charge of Everett-Moore affairs has practically completed deals for the sale of the syndicate's interests in the Detroit United Railways, the Northern Ohio Traction Company and the Toledo Railways & Light Company, these properties still remain unsold. Chairman Newcomb, of the committee, professes to be confident that all the deals will be closed up within the next thirty days. The option given to J. & W. Seligman & Co., of New York, on the property of the Toledo Railways & Light Company has expired, and although considerable time and money were spent in thoroughly investigating the property, the deal was not closed. New York and Cincinnati parties, who have been desirous of purchasing the Detroit United Railway, have been given another ten days' option, and it is claimed that if at the end of this time the deal is not closed a syndicate of Cleveland and Detroit people will be formed to purchase the property. It is understood that Tueker, Anthony & Company, of Boston, have made a new proposition for the purchase of the Northern Ohio Traction Company's property. Representatives of Tueker, Anthony & Company have just completed a thorough inspection of the property, and they seem to be the logical purchasers of the road, in view of the fact that they own the Akron-Canton and Canton-Massillon roads, and are building other lines which, with the Northern Ohio Traction, would give them a through line from Cleveland to Columbus. The local syndicate, headed by Horace Andrews, is also still in the field for this property, and may get it. Receiver Lang, of the Lake Shore Electric Railway, has arranged to dispose of the \$300,000 in receivers' certificates, and as soon as possible contracts will be closed for improvements which will make it possible to open up the through business between Cleveland, Toledo and Detroit.

Single Truck Interurban Cars

Although double-truck cars are the prevailing fashion at the present time, single-truck cars have by no means lost their popularity. Many roads prefer them to any other patterns, on account of the economy of the electrical equipment in first cost, as well as in the matter of repairs. The four-wheel car illustrated is one of an order recently shipped by the John Stephenson Company, Elizabeth, N. J., to the Auburn Interurban Electric Railway Company, of Auburn, N. Y.

The body is 20 ft. long and 7 ft. 3 ins. wide at the window rails. The sides have a 6-in. curvature. The total length is 29 ft. There



INTERIOR OF CAR WITH LONGITUDINAL SEATS

are seven windows on a side with seven ventilating sash in the roof. The seats are longitudinal and covered with spring cane. The trimmings throughout are of solid bronze, and the finish is cherry with three-ply maple headlinings. The car has completely enclosed vestibules at each end with three drop sash in front. The platform has a 9-in. drop, bringing the step low and making entrance easy. The platform timbers are plated with steel. In cars of this style, the Stephenson buffer beam is generally used, but in this case, for special reasons, a heavy oak steel-plated one was adopted.

The interior view shows a car built at the same time as those for the Auburn & Interurban Railway, but with a slightly different

A New Firm of Railway Engineers

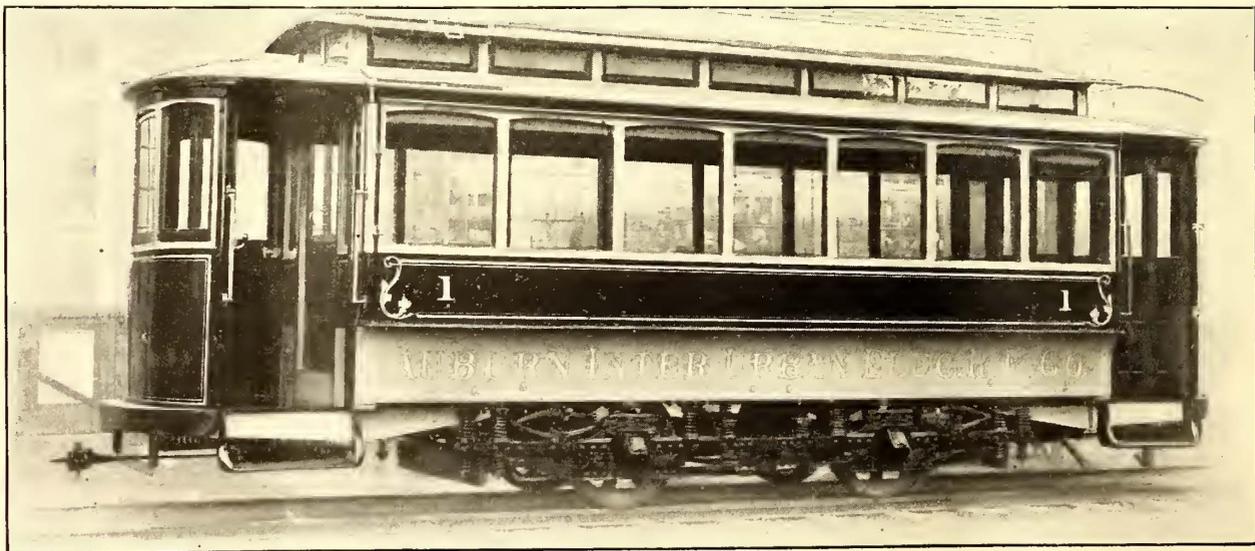
The many friends of W. E. Baker, until recently general superintendent of the Manhattan Railway Company, of New York, will be glad to learn that he has decided to remain permanently in that city. Mr. Baker will be associated after May 1 with H. R. Bishop, Jr., under the firm name of W. E. Baker & Company, with offices at 170 Broadway. This new concern will do a general electrical, consulting and contracting business, but will be more closely associated with that branch which deals with electric railway engineering than any other. Mr. Baker's long experience in heavy electric railway work with the West End Railway Company, of Boston, the Intramural Railway at the World's Fair at Chicago, the first third-rail installation, and during the construction of the Metropolitan West Side Elevated Railroad, of Chicago, added to his recent successful completion of the designs for the electrical equipment of the Manhattan Railway in New York, places him in a position where any suggestions made by him in regard to this class of engineering may be taken as authoritative. His partner has been connected with the General Electric Company for a number of years at its works in Schenectady, and lately in the New York office, and served as an officer in the First Regiment, U. S. V., Engineers during the late Spanish-American war, and is well equipped for solving such problems as are liable to arise in his new field. Mr. Bishop is the son of Heber R. Bishop, well known in financial circles.

The Four Track News

The May number of this illustrated magazine of travel and education, which is published monthly by the New York Central & Hudson River Railroad, is exceptionally entertaining. George H. Daniels, general passenger agent of the road, has a most interesting article on "Rapid Transit in New York," in which he gives a glimpse of the early railroad interests in and about Manhattan. The first rapid transit in the city of New York, and the only real rapid transit up to about 1853, was that afforded by the New York and Harlem Railroad. The charter for this company was granted on April 25, 1831. The several portions of the road were opened for public use as follows: From Prince Street to Fourteenth Street, 0.85 miles, Nov. 26, 1832; from Fourteenth Street to Thirty-Second Street, 0.87 miles, June 10, 1833; from Thirty-Second Street to Yorkville (now Eighty-Sixth Street), 2.71 miles, May, 1834.

Trolley Exploring

This is the title of a neat little pamphlet on electric railroading about New York city, compiled by Cromwell Childe, and published



EXTERIOR OF VESTIBULED CAR FOR AUBURN

interior finish. The seats are upholstered with carpet and the panels in the ends are handsomely inlaid. The end windows and doors have spring roller curtains as well as the windows. There are three rows of lights; one is in the center of the monitor roof, and two others in the posts at the tops of the windows. All seats are equally illuminated. All the cars have the usual fittings in the way of pedal gongs, signal and headlights, sand-boxes and draw-bars.

by the Brooklyn Daily Eagle, of Brooklyn, N. Y. The book describes a great number of routes to various points of interest on Long Island and Staten Island, and in New Jersey and Westchester County, as well as giving some interesting details for making such extended trolley trips as from New York to Boston and New York to Philadelphia. Maps of the suburban trolley lines in the Metropolitan district are included, and many interesting illustrations of

some of the points of interest to be reached by trolleys are given in the text. Trolley roads make possible hundreds of excursions for city people through delightful regions, but surprisingly few will take advantage of the opportunities at their very door unless their attention is called to them by some such book as this, and the importance of publications of this kind in increasing pleasure traffic is coming to be fully realized by street railway companies. The evident co-operation of the railways operating over the territory included in "Trolley Exploring" has placed at the compiler's disposal an opportunity to give an accurate description of the routes selected. The price of the book is 10 cents, and it is to be hoped that future editions will be issued, keeping the matter up to date and adding such new routes as the increasing requirements of regular travel are continually making necessary.

The World's Fair at St. Louis

The date of the Louisiana Purchase Exposition, which was to be held from April 30 to December 1, 1903, has been postponed for one year. It became evident to the management of the undertaking that to make a creditable showing at St. Louis it was necessary to have this extension of time, and after due deliberation the decision was made that much more advantageous results would follow if the year 1904 be chosen for the exposition. The department of electricity, under the able supervision of Professor W. E. Goldsborough, who has been appointed chief, will be one of the most interesting of the exposition. The Palace of Electricity will be located on the central avenue of the grounds, and will be one of the principal features from an architectural standpoint. The building was designed by Walker & Kimball, of Boston and Omaha, who were the chief architects of the Omaha Exposition. The heartiest co-operation is promised to all the exhibitors, who have the success of their exhibits at heart, and are working for the advancement not only of the particular field in which they are engaged but also for the prosperity of electrical and related industries. It is confidently expected that all interested in electrical engineering will not be disappointed in their hopes of seeing all that is new and important in this field. Negotiations are in progress looking to a much more comprehensive showing of the features of electrical achievement than has ever before been attempted, and although yet too early to speak with certainty of the detailed plans of the department, the excellence of the electrical displays of the Louisiana Purchase Exposition of 1904 is assured.

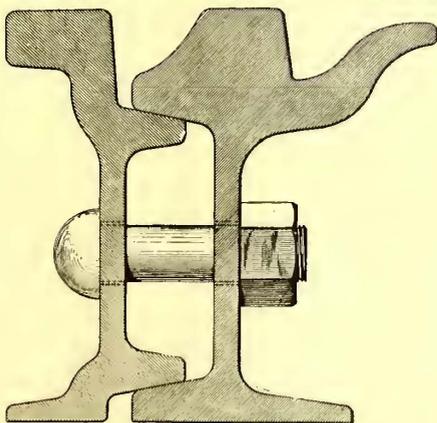
Street Railway Patents

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

UNITED STATES PATENTS ISSUED MAY 6, 1902.

699,173. Railway Rail; C. E. Hooven and J. W. See, Hamilton, Ohio. App. filed Feb. 17, 1902. A duplex rail comprising an outer tread, an inner tread separated from the outer tread by a groove and an inner guard separated from the inner tread by a groove, the rail being useful for two gages on the same roadbed.

699,197. Automatic Switch; F. S. Lewis, Baltimore, Md. App. filed Feb. 26, 1902. A guard rail is automatically raised and lowered between the switch point of the main rail whenever the former is moved.



PATENT NO. 699,173

699,218. Electric Switch Operating Device; A. J. McCullough, Meadville, Pa. App. filed March 29, 1901. The core of a solenoid

is connected directly with the switch point by a chain and acts thereon in opposition to a spring.

699,364. Trolley Stand; C. G. Bleasdale, Detroit, Mich. App. filed Aug. 14, 1901. The rotative support for the trolley stand is covered by a housing.

699,590. Electric Railway; A. A. Stolle, New York, N. Y. App. filed Oct. 22, 1901. The break which ordinarily occurs in the conductor located in the conduit at a crossing is mechanically bridged by automatic devices controlled by the car as it approaches the crossing.

ENGINEERING SOCIETIES

INDIANA ELECTRICAL ASSOCIATION.—At the preliminary meeting for the purpose of forming the Indiana Electrical Association, at Indianapolis, recently, T. C. McReynolds, of the Kokomo Railway & Light Company, was elected president. Mr. McReynolds was actively engaged in the formation of the organization. About twenty-five members were secured at the preliminary meeting. Other officers were elected as follows: First vice-president, J. H. Harding, Laporte; second vice-president, R. N. Parrott, Princeton; secretary-treasurer, Hal. C. Kimbrough, Muncie; executive committee, S. E. Gard, of Richmond; C. F. Hewitt, of Elkhart; A. M. Barron, of Franklin, and W. F. Weyerbacker, of Booneville; finance committee, A. M. Barron, of Franklin; J. H. Harding, of Laporte, and F. C. Hewitt, of Elkhart. The first regular meeting of the association will be held in Indianapolis on Sept. 17 and 18, for which an interesting programme of exercises will be provided.

PERSONAL MENTION

MR. E. L. HILLS has resigned as general manager of the Pennsylvania & Ohio Railway Company, of Ashtabula, Ohio, and his duties will be assumed by Mr. T. C. Smith, general superintendent of the road.

MR. DAVID L. BEAULIEU, of Worcester, Mass., has been appointed superintendent of the Lansdale & Norristown Street Railway, of Norristown, Pa., which road will be in operation at once. Mr. Beaulieu was formerly connected with the Worcester Consolidated Street Railway.

MR. GEORGE C. SIKES, who for some time has been secretary of the committee on local transportation of the Chicago City Council, has handed in his resignation. He is now in the East, however, collecting information for the committee, but expects to complete his labor within a short time.

MR. J. BOIES POTTER, superintendent of the Worcester & Connecticut Eastern Street Railway and the Webster & Dudley Street Railway, has been appointed superintendent of the Worcester & Webster Street Railway Company, and will have charge of the lines between Worcester and North Grosvenordale.

MR. JAMES A. STEWART has resigned as superintendent of the Herkimer, Mohawk, Ilion & Frankfort Railway, of Mohawk, New York, to become superintendent of the Utica Belt Line Street Railway, of Utica, N. Y., succeeding Mr. George L. Radcliffe, who has become superintendent of the Cleveland Electric Railway, of Cleveland, Ohio.

MR. J. W. BUTLER has been appointed manager of the outing department of the Cleveland Electric Railway Company, of Cleveland, Ohio. Mr. Butler's duties are to arrange and book Sunday-schools, societies, reunions and excursion parties for Cleveland public parks and resorts on the lines. Mr. Butler has been conducting excursions for twenty years.

MR. J. I. MANGE, who until recently has been connected with the engineering staff of the Lachine Rapids Hydraulic & Land Company, of Montreal, Can., has been appointed electrical superintendent for the Ononta, Cooperstown & Richfield Springs Railway Company. Mr. Mange's address is Hartwick, N. Y., where he will be glad to receive trade literature relating to railway supplies, car equipment and high-tension material.

MR. WILLIAM S. TOWNSEND has resigned as superintendent and purchasing agent of the Meriden, Southington & Compounce Tramway Company, of Meriden, Conn. Mr. Townsend is well known in New England, where he has held various important positions with electric railway companies. Mr. Townsend has been connected with the Meriden company for five years, becoming associated with it when the road was first placed in operation.

DR. F. A. C. PERRINE, president of the Stanley Electrical Manufacturing Company, of Pittsfield, Mass., delivered a most interesting address on "Success in Long-Distance Power Transmission," before the Institute of Arts, of the Massachusetts School of Technology, on Friday, May 8. The Stanley Company has made a large number of most successful installations of high-tension apparatus, and its president discussed in a most lucid manner the difficulties of power transmission over long distances which have been successfully overcome. The lecture was illustrated by a large number of lantern slides drawn largely from plants with the installation and successful operation of which Dr. Perrine had been personally associated in the Western States.

MR. GEORGE F. CHAPMAN, whose appointment as general manager of the United Railways of San Francisco was noted last week, was the recipient of many testimonials of the esteem in which he is held by his old associates in the East. The most significant demonstration in this line was that which took place on Friday evening, May 9, when about forty of the officers and heads of departments of the North Jersey Street Railway Company gathered at the banquet parlors of Ludwig Achtel-Stetter, 842 Broad Street, Newark, to bid Mr. Chapman farewell. After dinner had been served, and cigars lighted, Mr. Spencer Weart, general counsel of the company, made a pleasant speech, which he interspersed with short stories, and ended by presenting Mr. Chapman, on behalf of his associates, a diamond stud, as a token of the esteem in which he was held by his fellow officers. Mr. Chapman, in a very few words, thanked those present for their assistance throughout their business association, for their loyalty and good will, and also for the beautiful token of their respect which they had so kindly given him. Mr. C. M. Shipman, the newly appointed general superintendent, who presided, in a very brief address wished Mr. Chapman a pleasant trip from Hell Gate to the Golden Gate. Mr. A. W. Pratt, the road master; Mr. W. J. Brady, superintendent of the Hudson County division; Mr. E. N. Hill, the treasurer, and others spoke of the good feeling that has always existed between Mr. Chapman and his fellow officers, during the twelve years of his connection with the North Jersey, and they hope he would meet with success in his new venture. This sentiment expressed the feeling of the entire company, and the evening's entertainment closed with a hearty send-off for Mr. Chapman.

MR. WALTON H. HOLMES AND MR. CONWAY F. HOLMES, president and general manager respectively of the Metropolitan Street Railway Company, of Kansas City, Mo., resigned their positions with that company on May 6. Mr. C. F. Holmes was also president of the Kansas City Electric Light Company from which he retired on the same date. While those intimately connected with the Messrs. Holmes were not very greatly surprised at their leaving the properties, the news will come as something of a shock to their many friends throughout the country. Both of them have been failing in health for the last few years, and Mr. W. H. Holmes has recently passed through a serious illness, which made it necessary for him to be associated less actively with any important business undertaking. The opportunity thus offered of withdrawal decided Mr. C. F. Holmes to join his brother, and they will probably both take a long and much-needed rest, probably traveling abroad for the summer. After the announcement of their proposed retirement their employees lost no time in expressing their high appreciation of the many kindnesses that the management of the road had shown during the many years that the Holmes brothers have been connected with the property. On the evening of the day preceding his retirement President Holmes held an open reception in his office, and hundreds of his men, some of whom had been with him for twenty years, came in to bid him good-bye. Mr. Holmes says that although he has frequently been a host, on no occasion had he received a more heartily sincere reception than he got from his employees on this evening. With many expressions of regret and the recounting of personal kindnesses of the retiring president and general manager, the men showed their great good will to the two men who have not only been most influential factors in the development of the rapid transit facilities of the two Kansas cities, but have also been prominently associated with nearly all their commercial progress.

MR. GEORGE L. RADCLIFFE, formerly general superintendent of the street railway lines at Utica, N. Y., has been appointed general superintendent of the Cleveland Electric Railway Company, succeeding Mr. Edwin C. Faber, resigned. Mr. Radcliffe was superintendent of the Cleveland road under the former Andrews-Stanley regime.

MR. BERNARD CORRIGAN, one of the pioneers in the railway work of Kansas City, has been given the management of the combined electric railway and lighting companies of Kansas City.



B. CORRIGAN

On the retirement of Mr. W. H. Holmes, president of the railway company, and Mr. C. F. Holmes, president of the lighting company, these two properties were consolidated, and the necessity of having a vigorous and competent man to take charge of the combined interests lead to the selection of Mr. Corrigan. A man about forty years of age, a civil engineer by profession, and up to about ten years ago closely identified with street railway interests, Mr. Corrigan is thoroughly familiar with the management of railway and lighting properties, and has the hearty support of those financially interested and all of the old employees. He has built several steam roads in the South and West, and all his life has been spent in the management of men, and it is admitted on all sides that he has the best right to fill the position created by the consolidation of the railway and lighting companies.

MR. JOHN F. CALDERWOOD, comptroller of the Twin City Rapid Transit Company of Minneapolis, has resigned to become assistant to President J. L. Greatsinger, of the Brooklyn Rapid Transit Company, of Brooklyn, N. Y. Mr. Calderwood is a prominent member of the Street Railway Accountants' Association of America, and his name is a familiar one in street railway circles throughout the country. Before the purchase of the Third Avenue Railroad Company, of New York city, by the Metropolitan Street Railway Company, Mr. Calderwood was intimately connected with the workings of the former property, and if the consolidation had not taken place would undoubtedly have been made president. In coming East, therefore, he renews many old ties that were necessarily broken by his accepting the position of comptroller of the Minneapolis & St. Paul road. His new duties will consist in relieving President Greatsinger of a large amount of



W. H. HOLMES



J. F. CALDERWOOD

the details necessarily accompanying the operation of so important a railway system as that in Brooklyn, while at the same time he will be given every opportunity to bring his large experience in the difficult problems which confront the expert street-railway accountant to bear on some of the peculiar conditions which are at present handicapping the Brooklyn property. In selecting Mr. Calderwood as his personal assistant President Greatsinger has followed the conservative policy which has marked all of his acts since coming to Brooklyn, having waited until exactly the right man was found before taking any definite steps. That the addition of Mr. Calderwood to the personnel of the Brooklyn Rapid Transit Company will prove of great benefit to that property cannot be doubted, and his many friends will congratulate him on having been given so satisfactory a position for proving his ability in the management of both the physical and financial sides of street railway operation. Mr. Calderwood is not only a member of the Street Railway Accountants' Association of America, but is also a member of the Institute of Secretaries of London. He will assume his new duties as soon as he can satisfactorily sever his connection with the Twin City Rapid Transit Company, probably within a week from this date.

MR. CHARLES A. SPOFFORD has resigned as secretary of the Milwaukee Electric Railway & Light Company, to assist Mr. Charles T. Yerkes in the management of his London underground roads. Mr. Spofford will assume his new duties about June 1.

LEGAL DEPARTMENT

CONDUCTED BY WILBUR LARREMORE OF THE NEW YORK BAR

Contributory Negligence of Children

In a recent Sunday edition of one of the leading New York newspapers a full column was devoted to accounts of six different injuries to children in the streets by six different kinds of vehicles. Only one of such vehicles was a street car; the others, respectively, were an automobile, an ordinary horse cab, an electric cab, a private wagon and the wagon of an express company. This record of a single day's street casualties warrants the assertion that the special hue and cry against the carelessness of street car employees is without legitimate ground. With the existing and rapidly increasing congestion of population in New York, and especially in the borough of Manhattan, the beds of the streets between the curbs undoubtedly have become extra hazardous playgrounds for children. In *McKinney vs. Railroad Company* (104 N. T., 352) a marked distinction was recognized between permitting young children to play upon the sidewalks and upon the beds of streets between the curbs. The same distinction had been drawn in the earlier cases of *McGarry vs. Loomis* (63 N. T., 104) and *McGuire vs. Spence* (91 N. T., 303). This distinction grows more and more important with the growth of a city. We believe that care to avoid injury to children is exercised by motormen of street cars as faithfully and systematically as by any class of drivers of vehicles.

The law on the subject of contributory negligence of children is certainly sufficiently harsh and exacting against persons responsible for the operation of cars in the streets. There is a period of childhood in which it is uncertain and depends upon the development and experience of the particular child, whether he may be charged with the duty of avoiding ordinary dangers and taking care of himself. A child, who is thus *sui juris*, to use the legal phrase, defeats his right of recovery for injury by negligent acts on his part (*Tucker vs. Railroad Company*, 124 N. T., 308). The courts, however, hold not only that there is no arbitrary age of responsibility for self to be fixed; that whether a particular child was, or was not, *sui juris* is a question for the jury in each case arising; but also that the degree of care required of any child can be only such as might reasonably be expected, under the circumstances, from a person of his years. With the well-known disposition of juries in favor of injured persons and against railway corporations, it is easy to see that verdicts will almost uniformly be for the plaintiff.

A child of extremely tender years is held absolutely to be *non sui juris*, and, therefore, his actions, whatever they may be, cannot constitute negligence and cannot defeat his recovery. Some of the States carry this doctrine to its logical extreme by holding that the negligence of parents in permitting a very young child to escape into a public street, although it be unavoidably injured, cannot be "imputed" to the child, and a railway company or other instrumentality of injury, is liable for damages. There is considerable to be said, theoretically, on both sides, as to the propriety of recognizing the doctrine of imputed negligence with regard to children. It is quite plain, however, that the policy of the courts of New York and several other States in countenancing such doctrine makes for practical justice. The person injuring an irresponsible child may have been guilty of only a very slight fault, or of no fault at all, and the principal factor in the disaster, or its only real cause, may have been the presence of an infant so young as to be unable to take care of himself in a place where he should not have been suffered to go. While the action for damages may be nominally in the name of the child, the substantial party in interest is frequently the very parent through whose negligence the child was permitted to be at large. Allowing recovery in such cases would tend to encourage the same neglect of children for speculative purposes, which has almost everywhere led to limitations upon the amounts for which insurance may be procured on children's lives.

Even in New York the doctrine of imputed negligence is not carried to an extreme. A parent is not absolutely bound to restrain a child from going into danger, but is required only to use reasonable care to that end under the circumstances as they exist (*Mangan vs. Brooklyn Railroad Company*, 38 N. Y., 455). When, however, a child too young to take thought of the ordinary

dangers of the street goes there unguarded and is injured, explanation and justification of its presence are properly incumbent upon its parents. Accordingly, it has been held negligence, as matter of law, in the absence of explanation, to allow a child of about two years (*Hartford vs. Roper*, 21 Wend. [N. Y.], 615), two years and four months (*Callahan vs. Bean*, 9 Allen [Mass.], 401), seventeen months (*Kreig vs. Wells*, 1 E. D. Smith [N. Y.], 74), four years (*Glassay vs. Hestonville, etc.*, Railroad Company, 57 Penn. St., 172), to go out unattended. It is true that the courts of some of the States repudiate the whole doctrine of imputed negligence. It is believed, however, that it promotes substantial justice, and in States where it obtains it should be administered with judicial backbone.

LIABILITY FOR NEGLIGENCE.

NEW YORK.—Surprise as to Evidence.

A woman was injured in a railroad accident, and twelve days later was examined by the company's physician, complaining only of an injury to her shoulder and arm. At the trial of her action, over a year later, she proved the existence of hernia, caused by the accident. She had discovered it immediately, but did not ask medical aid until it became so troublesome that she had to do so. Her complaint alleged "serious and lasting bodily injuries, and injuries to her head, limbs and nervous system, as well as internal injuries." There was no application for an adjournment, or to withdraw a juror, no allegation of surprise, no motion to dismiss, no request for instructions on the question of damages, and no pretense that defendant, by reason of anything done or omitted, had been deprived of evidence. Held, error to set aside a verdict in plaintiff's favor on the ground of surprise.—*Dixson vs. Brooklyn Heights Ry. Co.*, 74 N. Y. Suppl., 49.)

NEW YORK.—Appeal—Presumption—Street Railways—Negligence of Passenger—Pleading—Evidence—Issues.

1. On appeal from a judgment of nonsuit plaintiff is entitled to the most favorable construction which the jury could properly have placed on the evidence.

2. A passenger on an open street car, having rung for the car to stop, and assuming that it would stop at the nearest side of a street which it was approaching, stepped out on the footboard, and the jolting of the car on passing over intersecting tracks threw him from the footboard. There was no evidence that the crossing was made at unusual speed. There was a sign in the vicinity which said "Stop," but it was not shown that the direction was to the motormen, or that it directed the car to stop at any particular point. Held, in an action for the injuries, that a nonsuit was proper.

3. An offer to prove that the condition of the tracks was bad where they intersected, and that by reason of such a condition plaintiff was thrown from the footboard, was properly excluded, no such negligence being charged in the complaint.—(*Nies vs. Brooklyn Heights Ry. Co.*, 74 N. Y. Suppl., 41.)

NEW YORK.—Railroads—Action for Injuries—Medical Testimony—Relevancy—Causal Connection—Excessive Damages.

1. Where a doctor examined plaintiff four months after he was hurt, and after another doctor had been attending him, it was not improper to ask such doctor what he found from his examinations, since it could not be determined whether the conditions which he found were or could have been caused by the accident until they were stated.

2. Where a doctor testified that he examined plaintiff four months after an accident, and after another doctor had been attending him, and that he found a certain swelling of the hip, and plaintiff testified that he was hurt on that hip, and most of his hurt was in that part of his body, it was sufficiently shown that the injury testified to by the doctor resulted from the accident, so as to make the doctor's testimony relevant.

3. Where, in consequence of defendant's negligence, plaintiff's left leg had become an inch shorter than the right, and the cartilage of the hip joint was wasting away, and plaintiff had become a victim to a permanent, progressive disease, which would cripple him more and more as it progressed, a verdict of \$3,500 was not excessive.—(*Napier vs. Brooklyn Heights Ry. Co.*, 74 N. Y. Suppl., 7.)

NEW YORK.—Street Railways—Personal Injuries—Exhibition of Plaintiff's Person—Evidence—Cross-Examination—Damages.

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

1. Where defendant in a personal injury action contended that plaintiff's injuries were not as serious as alleged, it was not error to allow the injured portion of plaintiff's body to be exhibited to the jury, and the injuries thereon to be pointed out by a physician.

2. Where one motorman had testified that the car was not going at a "high rate of speed" at the time of the accident, and another stated that the car was moving at a speed of about 6 miles an hour at the place of the accident, a question as to whether the car ran at a speed of less than 6 miles an hour at any point for some distance before the place of the accident was competent on cross-examination of the latter witness to test his recollection, and to determine what was meant by "a high rate of speed."

3. Where plaintiff in an action for personal injuries was forty-five years old, and had four ribs fractured and pushed in so as to cause permanent injury, affecting respiration and producing constant pain, and destroying his earning capacity, which had formerly been \$10 a week, a verdict for \$4,500 was not excessive.—(Perry vs. Metropolitan St. Ry. Co., 74 N. Y. Suppl., 2.)

NEW YORK.—Carriers—Street Railroads—Injuries to Passengers—Opening Statement—Dismissal—Introduction of Evidence—Necessity.

1. Where a street car passenger, intending to alight, leaves his seat and places himself on the step while the car is in motion and slowing up as if about to stop to let off passengers at a crossing, and while the conductor is in the front part of the car collecting fares and in such a position as not to see the passenger, and he is thrown off and injured by the sudden increase of the speed of the car before he has indicated to the conductor that he intends to alight, such acceleration of speed, unaccompanied by any other fact except that the conductor, in order to perform his duty of collecting fares, has placed himself in a position where he cannot see the passenger as he intends to alight, is not a foundation for a charge of actionable negligence, and, when nothing more is alleged or claimed in plaintiff's opening statement, the complaint is properly dismissed.

2. Where, assuming all the facts as stated by plaintiff's counsel in his opening statement to be proven, a finding in plaintiff's favor will not be sustained, the court may dismiss the action without waiting for the introduction of the evidence.—(Sims vs. Metropolitan St. Ry. Co., 72 N. Y. Supp., 835.)

NEW YORK.—Personal Injuries—Street Railways—Assault on Passenger—Municipal Court—Jurisdiction.

Where plaintiff boarded the front platform of defendant's car while it was in motion, and was then seized by the gripman and thrown into the street, an action for damages was for the neglect of a duty which was owing to the plaintiff as a passenger, and was not a mere action for personal assault, so as to deprive the municipal court of jurisdiction.—(Hart vs. Metropolitan St. Ry. Co., 72 N. Y. Supp., 798.)

NEW YORK.—New Trial—Sufficiency of Record—Case—Bill of Exceptions.

Code Civ. Proc., Sec. 997, provides that a party applying for a new trial of an issue of fact must make a case, signed by the trial judge, which contains so much of the evidence and proceedings upon the trial as is material to the questions raised on the application, together with his exceptions. A bill of exceptions, presented on a motion for a new trial in an injury case, contained all the evidence of defendant's negligence. The judge's charge to the jury, made a part of the record, showed that the insanity of the party injured was a conceded fact. The affidavits of the plaintiff, his committee, on the motion, asked on account of newly discovered evidence, averred that such party had become sane, and was in a condition to testify to material facts, which, if believed, would authorize a different verdict. Held, that as the case required by Code Civ. Proc., Sec. 997, embraces a bill of exceptions, the record was sufficient to entitle plaintiff to be heard upon the merits of the application for a new trial.—(Stiasny vs. Metropolitan St. Ry. Co., 72 N. Y. Supp., 747.)

NEW YORK.—Street Railway—Foot Passenger—Injury—Evidence—Question for Jury.

Plaintiff, a boy of five years, in charge of another boy of eleven years, was struck by a car horse, and injured, while attempting to cross a street railway track in front of a horse car and behind a wagon preceding the car. The elder boy testified that when they reached the track the car was about 30 ft. distant. Another witness testified that when he saw the two boys between the two tracks the car was from 30 ft. to 35 ft. away; that the horses were moving very fast, and the driver whipping them with his lines. The car driver testified that when he first saw the boys plaintiff was running, and looking toward the car, about 15 ft. or 20 ft. away, and there was a space of about 10 ft. between his horses' heads and the rear end of the wagon. Held, that the question of defendant's negligence in failing to avoid the accident was for the

jury.—(Gumby vs. Metropolitan St. Ry. Co., 72 N. Y. Supp., 551.)

NEW YORK.—Action for Negligence—Evidence—Findings.

1. On a finding by a jury that a man, injured by defendant's negligence ten months before, died of quick consumption, which existed for only two months, a further finding that he would not have died at the time he did but for the injury was not sustained by the evidence.

2. Where a person was injured by the negligence of a street car company, and some months thereafter, when he had not yet recovered from his injuries, was stricken with quick consumption and died, it is a matter of speculation, insufficient to sustain a verdict, as to whether he would have died before the action was brought but for the intervention of a new controlling cause.—(Hoey vs. Metropolitan St. Ry. Co., 72 N. Y. Supp., 544.)

NEW YORK.—Injuries to Traveler on Highway—Street Railways—Negligence of Motorman.

Plaintiff's intestate, a bright boy, fourteen years of age, was kicked off the front platform of a street car by the motorman, and fell, screaming, on his back. He got up and walked slowly and lame across the other track, when he was struck by a car coming from the opposite direction from the one on which he had been riding, and received injuries causing his death. Held, error to nonsuit plaintiff, as the question of whether he was in the exercise of ordinary care under the circumstances was for the jury.—(Pinder vs. Brooklyn Heights R. Co., 72 N. Y. Supp., 1082.)

NEW YORK.—Negligence—Death—Damages—Street Railways—Crossings—Rights of Private Conveyances—Instructions—Qualifying Remark—Withdrawal—Operation of Car at Crossing—Presumption.

1. Fifteen thousand dollars is not excessive damages for negligently causing the death of a healthy workingman, thirty-six years old.

2. In an action for death caused by the collision of a street car with a coach at a crossing, an instruction that the driver of the coach was entitled to the presumption that the car would be moved at that point under a reasonable state of control, so that it might be readily stopped in case of emergency, to give him an opportunity to get over in safety, was not erroneous.

3. Neither a street railway car nor the driver of a carriage has a paramount right of way at a crossing, but their rights are equal.

4. Error of the trial judge in remarking, as he was about to give an instruction requested by one party, and assented to by the other, that he would charge it although he did not think it was sound, was rendered harmless by the subsequent explicit withdrawal of the statement, and the express direction that the jury must follow the proposition of law as charged.

5. In an action for death caused by collision with a street car at a crossing, where there was no testimony to the effect that the motorman took any thought with respect to the safety of his action in operating the car, an instruction that, if plaintiff's intestate had a right to assume that he could cross the street in safety, the motorman might indulge in the same presumption without negligence, was properly refused.—(Reilly vs. Brooklyn Heights R. Co., 72 N. Y. Supp., 1080.)

NEW YORK.—Street Railroads—Negligence—Injury to Passenger—Instructions.

Where, in an action against a street railroad company for injuries sustained by plaintiff by being thrown from an open car at or near a curve—the guard rail along the side of the car being up at the time—it was shown by uncontradicted evidence that the sole object of the rail was to prevent persons from boarding or leaving the car on that side, it was error to instruct the jury that the object of the bar was for their consideration, and they must determine whether, if down, it would have contributed to plaintiff's safety.—(Witaker vs. Staten Island Midland R. Co., 72 N. Y. Supp., 814.)

NEW YORK.—Negligence—Escaping Steam—Accident to Traveler.

Plaintiff's horse became frightened at the escape of steam through an automatic safety valve on a steam roller standing in the street about three rods from the horse, and plaintiff, in his attempt to control the horse, received injuries of which he complains. Plaintiff knew that the roller was in the street before going there, and the defendant was in the proper use of the street, and had complied with the statutory requirements of notifying persons approaching within one-eighth of a mile. Held, that the defendant was not guilty of actionable negligence, the escape of steam through the safety valve being incident to the ordinary operation of a steam engine.—(Rector vs. Syracuse Rapid Transit Ry. Co., 72 N. Y. Supp., 745.)

NEW YORK.—Street Railroads—Injury to Traveler on Track—Evidence.

Plaintiff's intestate was run over and killed by defendant's street

car, and this action was brought on the theory that such intestate was lying on or near the track in an unconscious condition when struck, and that the defendant was negligent in running its car at an excessive rate of speed and in failing to discover the deceased. Deceased, while somewhat intoxicated, alighted from another car, about a quarter of an hour before the accident, near the place thereof, but there was no evidence as to the rate of speed of the car which struck him, or that he was lying in an unconscious condition on or near the track. Held, that the evidence was insufficient, and plaintiff's recovery properly denied.—(Mathison vs. Staten Island Midland R. Co., 72 N. Y. Supp., 954.)

NEW YORK.—Personal Injuries—Complaint—Allegations—Proof—Amount of Damage.

1. Where plaintiff alleged that he sustained serious and lasting bodily injuries to his head, limbs and nervous system, it was not error to admit testimony of impaired hearing and eyesight.

2. Where a passenger in a street railway car, who was injured in a collision, was absent from his regular work for less than two months, after which he continued doing full service, receiving full pay and on application for promotion as a fireman passed the physical examination, and partially succeeded in various difficult athletic feats, a verdict of \$6,500 on the ground that he could not work as he used to do, that his nervous system was affected, his back and leg stiff, and his hearing and eyesight impaired, was excessive.—(Mullady vs. Brooklyn Heights R. Co., 72 N. Y. Supp., 911.)

NEW YORK.—Master and Servant—Injury to Servant—Improper Appliances.

Plaintiff was employed as a lineman by defendant, and while fastening a charged span wire into an insulated coupling, which proved defective, received an electric shock. It was not shown that the defendant had made any test of the coupling, though it was practicable to make such tests, but the defendant's president testified that all the couplings were purchased from a respectable manufacturer, who had agreed to make an inspection in the factory before delivery. Held, sufficient to go to the jury on the question of whether reasonably safe appliances had been furnished by the defendant.—(Murphy vs. Coney Island & B. R. Co., 73 N. Y. Supp., 18.)

PENNSYLVANIA.—Street Railways—Negligence—Parent and Child—Question for Jury.

Where, in an action by a father against a street railway company for injury to his son, fourteen years old, who rode on defendant's cars to a park, in company with his married sister and her husband, and was thrown under a car which he was about to take to return home, it is claimed by defendant that plaintiff was negligent in permitting his son to go to the park under such circumstances, the question is for the jury.—(Muhlhouse vs. Monongahela St. Ry. Co., 50 Atlantic Rep., 940.)

PENNSYLVANIA.—Street Railroads—Negligence—Crowd in Park—Question for Jury—Evidence.

Where plaintiff, while waiting at a street car station in a park to take a car, was struck by persons riding on the car platform, and thrown under the car, and there is evidence that there were 150 people waiting for the car, which would carry about half that number; that the car entered the station at a dangerous rate of speed; that the number at the station was not unusual; and that there was no person or officer at the gateway or station to control or direct the movements of the crowd—the question of the company's negligence was for the jury.—(Muhlhouse vs. Monongahela St. Ry. Co., 50 Atlantic Rep., 937.)

PENNSYLVANIA.—Street Railways—Personal Injuries—Pedestrians—Infants—Evidence—Trial—Question for Jury.

Where, in an action for personal injuries to a child by being struck by defendant's street car, there was evidence that the car was moving at an unusual rate, and the motorman stated that it was going at the rate that full power would take it—"going as fast as the car could go"—and that the child started to cross the street when the car was at least 100 ft. away, and that she was in plain view of the motorman, who could readily have seen her in time to have stopped the car, there was no error in submitting the case to the jury.—(Nolder vs. McKeesport, W. & D. Ry. Co., 50 Atlantic Rep., 948.)

PENNSYLVANIA.—Street Railways—Crossings—Vehicles—Collision—Contributory Negligence—Question for Jury.

Plaintiff's evidence showed that as he was driving he approached an intersecting street along which ran defendant's street railway, and saw a car turning into the intersecting street; that the car was about 220 ft. away; that, thinking that he had time to cross, he drove on, and, before his wagon crossed the second track, it was struck by the car. Plaintiff testified that when he saw the car the motorman was standing away from the brake and look-

ing from the side of the car. Had the car continued at ordinary speed plaintiff's wagon would have crossed in safety. Held, that the question of contributory negligence was for the jury.—(Hamilton vs. Consolidated Traction Co., 50 Atlantic Rep., 946.)

PENNSYLVANIA.—Street Railways—Injury to Pedestrian—Contributory Negligence.

A pedestrian struck by a street car is guilty of contributory negligence, he having walked on the car track at night to avoid the mud on the pavement, taking the chance that the approach of a car could be detected.—(Penman vs. McKeesport, W. & D. St. Ry. Co., 50 Atlantic Rep., 973.)

PENNSYLVANIA.—Husband and Wife—Injury to Wife—Separate Actions.

1. Act May 8 1895 (P. L. 54), Sec. 1, provides that, whenever injury not resulting in death shall be wrongfully inflicted on a wife, and a right of action accrues to the wife, and also to the husband, the two rights of action shall be redressed in one suit. Sec. 2 declares that either husband or wife may waive the right of action, and that failure to join in the suit within 20 days after service of a rule to join shall be conclusive evidence of such waiver. Held, that Sec. 2 did not authorize a second suit by a husband or wife not a party to the first, and not served with a rule to join, but merely provided that where the rule to join was served, and the party did not join, the other might proceed alone.

2. Act May 8, 1895 (P. L. 54), authorizing but one action by both husband and wife for injuries received by the latter, is constitutional, the marriage relation being a civil contract involving rights under the control of the Legislature.—(Donoghue vs. Consolidated Traction Co., 50 Atlantic Rep., 952.)

PENNSYLVANIA.—Street Railroads—Negligence—Evidence—Presumption—Burden of Proof—Question for Jury.

1. Plaintiff's evidence showed that his wagon was standing on one of defendant's tracks, and that in front of him were two cars, and that, as the second car moved up a grade, the trolley wheel slipped, and the car slipped backward and struck the car back of it, when either the force of the collision drove the rear car against the wagon or the motorman of that car moved it backward to avoid a collision. Held, that the evidence raised a presumption of negligence on the part of the defendant, and made it incumbent on it to show due care.

2. The question whether defendant had exercised due care was one for the jury.—(Campbell vs. Consolidated Traction Co., 50 Atlantic Rep., 829.)

VERMONT.—Railroads—Terminal Connection—Terms—Commissioners—Appointment—Costs.

1. Under V. S., sec. 3864, providing that where the officials of two railroads which cross or connect cannot agree as to terms relating to the transfer and carriage of goods, delivery of cars, etc., either road may petition for appointment of commissioners to make an award, a petition will not be dismissed because no recognition for costs is given by the petitioner; no such recognition being required by the statute.

2. Where a company was incorporated to construct and operate a street railroad for the transportation of persons and property, and with right to occupy so much of the streets and highways on its route as necessary, and power to acquire such real estate and rights of way as were necessary to its business, and to exercise the right of eminent domain, and its tracks approach the terminal of another road, it is subject to V. S., chap. 169, sec. 3860 et seq., providing that, where railroads cross or connect, they shall furnish each other with accommodations in the transportation of passengers and goods, and it is not essential that such road already own any property connecting with the property of the other road.—(Rutland R. Co. vs. Bellows Falls & S. R. St. Ry. Co., 50 Atl. Rep., 636.)

WASHINGTON.—Street Railroads—Negligence—Injury at Crossing—Evidence—Question for Jury.

1. In an action against a street railway for injuries at a crossing, plaintiff testified that when he started to cross the street he did not see any car moving in his direction. It was shown that the ordinary rate of speed of cars was 10 miles an hour, and that a greater speed than 12 miles an hour was prohibited; that the car was going from 16 to 18 miles, some witnesses placing its speed as high as 20 miles; that no bells were sounded or warning given; and that the crossing was a crowded one. The motorman did not see plaintiff until he was within 30 ft. of him, and testified that the car could not have been stopped in less than 50 ft. if moving 12 miles an hour. Held, that the question whether plaintiff was guilty of negligence was for the jury.

2. One about to cross a street car track is not bound to look and listen, in order to be free from negligence.—(Chisholm vs. Seattle Electric Co., 67 Pac. Rep., 601.)

FINANCIAL INTELLIGENCE

THE MARKETS

The Money Market

WALL STREET, May 14, 1902.

The strain in the money market has given no evidence of relaxing during the last week. On the contrary the feeling of uncertainty over the outlook has been intensified. Saturday's bank statement showed that the surplus reserve had been more than cut in two from the previous week, reducing the total to a paltry \$3,400,000. This is, of course, altogether abnormal for the present season, when, ordinarily, local bank reserves are approaching their maximum. Three circumstances are to be noted as the particular causes for the highly unsatisfactory position, first that the Treasury revenue collections have continued to exceed routine disbursements without any offset of an extraordinary nature like government bond redemptions; second, that the circulating medium throughout the country is unusually well employed by the trade activity and high commodity prices, and that consequently the usual spring flow of currency toward this centre is greatly curtailed; and third, that the demands for bank credits for various syndicate enterprises have been exceptionally active during the last four months. There is another factor which would be equally important with any of these, but its operation has been abruptly checked by the advance in local money rates. This is the recall of the foreign capital loaned out in great quantity upon this market. The rise in money by forcing down exchange rates, has shelved the problem for the moment. But the question of settlement is bound to come up in the near future, when the alternative will be presented, either of meeting our foreign obligations by heavy shipments of our staple products, or of exporting, like we did last autumn, a large sum of gold. As for the more immediately pressing situation which has arisen from domestic causes, much depends upon the tendency of the high money premiums to increase the forwardings of currency from the interior centres. Whether relief by this means is great or small, however, it is quite evident that loan contraction, voluntary or involuntary, will have to be carried a good ways further, if bank reserves are to be brought up, even to an approximately normal level.

Call money loaned on the Stock Exchange averages at the moment about 8 per cent. Bankers are putting out their time loans at 5 to 6 per cent for sixty to ninety days, and 5½ per cent for longer periods.

The Stock Market

The speculative campaign which was in progress during the greater part of April on the Stock Exchange, has been definitely suspended during the last fortnight. The market has returned to very much the same state of dullness and hesitancy which it occupied previous to the upward movement. Whatever outside interest there was in the dealings, has completely disappeared, and the leading operators and banking syndicates have relinquished their efforts to force a higher level of prices. On the other hand, the indications all are that the available supply of securities is as strongly held as it has been at any time, and that those who own the stocks are not anxious to sell despite the various causes of uncertainty and apprehension which exist in the outside situation. The market in fact has given another remarkable display of steadiness in the face of successive shocks, which, had the speculative position been anything but sound, would have unquestionably led to a serious break. First the collapse of the Webb-Meyer syndicate two weeks ago, then the troubles culminating in the suspension of work in the anthracite coal regions, then the deterioration in winter wheat conditions as shown by the government crop report of Monday, and, finally and most trying of all, the strained situation already described in the money market—all of these developments, occurring almost simultaneously, have afforded a test as severe as any that could well be conceived. Naturally the immediate future is a matter of considerable uncertainty and great diversity of opinion. But there can be no mistaking the underlying strength which is reflected in the current action of the market. Everything now waits upon a solution of the difficulties represented by the high money rates, the low bank reserves, and the cautious disposition of money lenders. Until conditions become more normal in this respect, active speculative operations will necessarily have to be kept in abeyance.

The excellent statement of Manhattan for the March quarter made public yesterday, was the incident of chief interest in the market for the local traction stocks. The increase in traffic and earnings shown in this report, fully meets the most optimistic predictions. Briefly stated, the results indicate that Manhattan's

business is going ahead by leaps and bounds, and that without allowing anything at present for the economies of the electric system, the increased traffic is being handled with only a very slight addition to operating expenses. At the rate shown in the three months from December to March, the company is earning fully 8 per cent on its outstanding stock. The recent buying of Manhattan shares has been of a good character, but no attempt is being made to advance the price. In common with the other tractions, the movement has merely corresponded to the fluctuations in the general market. The decline in Metropolitan has reflected operations of a bear clique more largely than actual liquidation.

Philadelphia

The Union Traction shares have been traded in much less extensively than on previous weeks, probably because the details of the lease to the Philadelphia Rapid Transit Company are mostly all out, and the speculation has no mystery to work upon. Nevertheless the diminished activity has not been accompanied by any decline from recent prices, a fact which indicates that those who are holding the stock have confidence in its value under the new arrangement. Rights to subscribe to the new lessee company shares, which were dealt in privately a few weeks ago at 4½ have been admitted to dealings on the Exchange, and have sold as high as 6. It is announced that the lease of the Union Traction will not be signed until the first \$5 installment has been paid upon the new issue. The demand for Indianapolis Street Railway issues has been renewed with some vigor, the stock being bid up to 63, and the bonds to the highest figure they have ever sold at. The buying has come from representatives of people who have certain plans for the property which they are not ready yet awhile to fully disclose. A fair demand for Easton Consolidated Electric is reported between 19½ and 20. Other sales for the week comprise odd lots of Consolidated Traction of New Jersey at 69¾ and 69½. Camden and Trenton Railway at 4. American Railways at 46½ and 46¼. Green & Coates Passenger at 151½. Philadelphia Traction at 97¾. Fairmount Park Transportation at 23¾, and Reading Traction at 32. Dealings in bonds have been comparatively narrow. Electric-People's Traction 4s were in good request at 98½. Indianapolis 4s sold up to 86¾, and Consolidated Traction of New Jersey 5s sold at 112¼, but these were all the sales recorded in traction bonds during the week.

Chicago

Judge Seaman's decision throwing the ninety-nine year franchise case out of the Federal court for lack of jurisdiction, was technically adverse to the Union Traction and the other companies, interested. But inasmuch as the decision declared against the position which the city government has taken in seeking to compel a renewal of existing franchises, it gave the officials of the company hope that in the future prosecution of their case, they will be successful. The decline in Union Traction common from 21 to 19½, and the preferred from 58 to 55, appears not to have referred to this legal uncertainty, but simply to the reactionary tendency in the general speculation. No sales were recorded in City Railway, but West Chicago fell on scattering sales from 101 to 98. Buying in Lake Street Elevated, which has kept the stock unusually steady around 13, was due to the rumor that the property is being acquired, for control by the Metropolitan. There is absolutely no confirmation for these reports. Metropolitan shares have hardly been dealt in at all during the week. The common has sold in small lots at 40. A hundred shares of the common stock at 38 comprised the week's dealings in Northwestern Elevated. Developments are expected soon in the plan of this company to perfect an extension to Evanston over the St. Paul Railroad's branch line.

Other Traction Securities

Irregular fluctuations on fairly heavy dealings in Massachusetts Electric issues were the only feature of the week on the Boston Exchange. The common stock, after selling as high as 44¾ recoiled to 43¾, and the preferred from 98 to 97¼. Profit-taking in sympathy with a similar disposition in other speculative quarters was the only reason that appeared for the decline. Nothing at all has been done in Boston Elevated or in West End stocks. In Baltimore the United Railway securities have been somewhat stronger, the stock rising fractionally to 165%, and the income bonds touching 72¼, which is the highest they have sold in a long time. Norfolk securities have been well bought on the satisfactory progress of the consolidation and reorganization deal in that city. Norfolk Railway and Lighting 5s were held at 94 and the stock at 12¾, while Norfolk Street Railway 5s advanced from 113¼ to 114. Other Baltimore transactions for the week comprised Toledo Traction 5s

at 104¾, Atlanta Consolidated 5s at 107½, Nashville Railway 5 per cent certificates at 63 up to 64½, and Lexington Street Railway 5s at 102½. No important change has occurred in the quotations of New York specialists for any of the inactive street railway specialties. St. Louis Transit, which for sometime past has been extremely dull, rose on the purchase of a few hundred shares in its home market, to 31. The new San Francisco issues continue to command attention on the New York curb, but all of them have suffered from realizing sales during the week. The common stock is down a point to 24¾, the preferred a point and a half to 59¼, and the subscription privileges a point to 100¾. The rise in New Orleans securities continues, the common selling this week as high as 33¾, and the preferred advancing two points to 112. These are the highest figures of the movement. The floating supply of the shares is said to be exceedingly small. On moderate transactions Louisville Street Railway common rose to 121, which is twelve points above its quotation of a month ago. Small sales of the preferred were recorded at 115½.

Another week of inactivity on the Cleveland Stock Exchange. There was a slight flurry in Southern Ohio Traction, occasioned by the consolidation of this with other affiliated properties; something less than 600 shares changing hands at from 62 to 65, the latter the closing figure. All other tractions showed declines. Northern Ohio Traction sold at 34 for common and 84 for preferred. Detroit United dropped from 71½ to 70½, 400 shares selling; Elgin, Aurora & Southern dropped from 38 to 37, 300 shares selling. Two blocks of Toledo Railways & Light were sacrificed at 20 and 21, with a wide margin between the prices bid and asked at the close.

Security Quotations

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

	Closing Bid	
	May 6	May 13
American Railways Company	46	46
Boston Elevated	163	164
Brooklyn R. T.	67½	65¾
Chicago City	a220	215
Chicago Union Tr. (common)	20¾	19¾
Chicago Union Tr. (common)	20¾	19¾
Cleveland City		106¾
Cleveland & Eastern	31	30
Cleveland Electric	82¾	a83½
Columbus (common)	54	52¼
Columbus (preferred)	104	107½
Consolidated Traction of N. J.	70	69¾
Consolidated Traction of N. J. 5s.	112	112
Detroit United	71¼	70¾
Electric-People's Traction (Philadelphia) 4s.	98¾	98½
Elgin, Aurora & Southern	40	36
Indianapolis Street Railway 4s.	86¾	86¾
Lake Street Elevated	13¾	13
Manhattan Ry.	133½	131¾
Massachusetts Elec. Cos. (common)	43½	43
Massachusetts Elec. Cos. (preferred)	97½	96¾
Metropolitan Elevated, Chicago (common)	39½	39
Metropolitan Elevated, Chicago	90¾	90½
Metropolitan Street	151	147¼
New Orleans (common)	32¼	33¾
New Orleans (preferred)	110	112
North American	127	122
Northern Ohio Traction (common)	34	33
Northern Ohio Traction (preferred)	85¼	83½
North Jersey	27	27
Northwestern Elevated, Chicago (common)	37	a38
Northwestern Elevated, Chicago (preferred)	85¼	a85½
Philadelphia Traction	97¾	97¾
St. Louis Transit Co. (common)	30½	30¾
South Side Elevated (Chicago)	a115	a115
Southern Ohio Traction	64¾	65¾
Syracuse (common)	24	24
Syracuse (preferred)	64	62
Third Ave.	130	130
Toledo Railway & Light	28	20
Twin City, Minneapolis (common)	120¼	118¼
United Railways, St. Louis (preferred)	83¾	84
United Railways, St. Louis, 4s.	88	87½
Union Traction (Philadelphia)	43½	43½

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

Iron and Steel

The scarcity of steel has reached a point where it threatens an actual shutdown of a part of the plate mills on account of the difficulty in getting supplies. The product of the steel plate mills is already sold for the rest of 1902, and orders have been booked during the past week for delivery in 1903. In steel rails the situation is very much the same, and \$31 a ton is being paid for small lots. The supply of Bessemer pig iron is down so low that high premiums are necessary to bring anything like prompt delivery. Sheet man-

ufacture is the only branch of the industry in which the demand is not particularly urgent. Quotations are as follows: Bessemer pig iron, \$21.25 and \$21.75; steel billets, \$33 to \$34, and steel rails, \$28 nominal.

Metal

Quotations for the leading metals are as follows: Copper, lake, 12½ cents; tin, 29.80 cents; lead, 4¾ cents, and spelter, 4.45 cents.

SAN FRANCISCO, CAL.—The United Railway Investment Company, of San Francisco, organized last February, has filed with the Secretary of State of New Jersey a certificate increasing its capital stock from \$2,500 to \$25,000,000. Of the capital \$15,000,000 is to be preferred stock bearing 5 per cent. cumulative dividends and \$10,000,000 common stock. This company was organized as a medium to transfer the securities of the various San Francisco street railway companies to the United Railroad Company, which will operate the properties.

JACKSONVILLE, FLA.—The announcement is made that Stone & Webster, of Boston, who were reported as negotiating for the purchase of the Main Street Railroad and the Jacksonville Street Railway, have closed the deal.

LOUISVILLE, KY.—The Louisville, Anchorage & Pewee Valley Electric Railway Company has made a second mortgage to the Fidelity Trust & Safety Vault Company, of Louisville, as trustee, to secure \$150,000 of thirty-year 5 per cent gold bonds to be issued for improvements, etc.

BOSTON, MASS.—The Railroad Commissioners will give a hearing on May 19 to the petition of the West End Street Railway Company for the approval of an issue of \$300,000 bonds to refund bonds of the Highland Street Railway Company, which became due May 1, 1902.

BOSTON, MASS.—The Senate has passed to be enacted, without debate, and sent to the Governor for signature the bill to permit the Old Colony Street Railway Company to lease a portion of its lines in Boston to the Boston Elevated Railway.

BOSTON, MASS.—The petition of the Concord & Boston Street Railway Company for approval for an issue of bonds has been denied by the Board of Railroad Commissioners. In October, 1901, the company was authorized to issue its original capital stock amounting to \$50,000, and the petition for bonds was filed in December, 1901. After examination of the books of the second appraisal of the property by an independent expert it was decided that the true valuation of the property above the outstanding stock was not sufficient to warrant the issuing of the additional bonds.

DETROIT, MICH.—The Detroit United Railway Company has sold to Gay & Company, of New York, \$1,000,000 of 4½ per cent. thirty-year bonds. The same firm has also obtained an option on \$500,000 additional bonds in case the company decides to issue them. The money secured will be used to pay off the floating indebtedness of the company contracted at the time of the purchase of the Detroit & Port Huron Shore Line and the Windsor (Ont.) lines. The company owns 75 per cent of the stock of the Detroit & Port Huron Shore Line and all of the stock of the Windsor lines. The total mileage of the system is 504 miles. The new issue of bonds increases the bonded indebtedness of the company to \$16,880,000.

MINNEAPOLIS, MINN.—The Twin-City Rapid Transit Company is to issue \$1,500,000 new common stock. The present capital stock of the company consists of \$3,000,000 7 per cent preferred stock and \$18,000,000 common stock. The proceeds of the new stock will be used to provide a new power station, plans for the building of which have previously been made public.

OMAHA, NEB.—The stockholders of the Omaha Street Railway Company have voted to increase the capital stock of the company from \$5,000,000 to \$6,000,000 principally for the purpose of acquiring the capital stock of the Omaha & Council Bluffs Railway & Bridge Company. Both companies are at present owned by the same interests.

SYRACUSE, N. Y.—A syndicate of Philadelphia capitalists is reported to have purchased the Syracuse, Lake Side & Baldwinsville Railway. Snyder & Wright are the reported purchasers.

ONEONTA, N. Y.—The Railroad Commissioners have granted the application of the Oneonta, Cooperstown & Richfield Springs Railroad for permission to increase its capital stock from \$1,000,000 to \$1,500,000, and also to issue a mortgage for \$1,500,000. The proceeds are to be used to retire an outstanding indebtedness of \$750,000 and for improving the road.

LONG ISLAND CITY, N. Y.—The New York & North Shore Railway Company was sold under foreclosure proceedings May 7 by order of William W. Gillen, of Jamaica, the referee, under proceedings instituted by the New York Security & Trust Company, creditors. The road was bought in by William E. Stewart for E. Clarence Miller, of Philadelphia.

FAR ROCKAWAY, N. Y.—The Rockaway Electric Railway Company has given to the Hamilton Trust Company, of Brooklyn, a mortgage of \$250,000 on its property to secure an issue of 250 4 per cent fifty-year gold bonds of \$1,000 each, the proceeds of the sale of which are to be used in building the lines of the company at Rockaway Beach.

HAMILTON, OHIO.—Final legal steps for merging the Southern Ohio Traction Company, the Cincinnati Northwestern Railway Company, the Miamisburg & Germantown Traction Company and the Hall, West Hamilton & Lindenwood Electric Transit Company have been taken. The companies will be incorporated under the title of the Cincinnati, Dayton & Toledo Traction Company, with a capital stock of \$5,000,000.

MEMPHIS, TENN.—C. K. G. Billings, of Chicago, Ill., president of the Memphis Street Railway Company; F. G. Jones, of Memphis, vice-president and manager of the Memphis Street Railway Company, and other interests identified with that company, have purchased the property of the Memphis Light & Power Company.

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.

COMPANY	Period	Total Gross Earnings	Operating Expenses	Net Earnings	Deductions From Income	Net Income, Amount Available for Dividends	COMPANY	Period	Total Gross Earnings	Operating Expenses	Net Earnings	Deductions From Income	Net Income, Amount Available for Dividends
AKRON, O.							DULUTH, MINN.						
Northern Ohio Tr. Co.	1 m., Mar. '02	51,204	29,620	21,584	12,500	9,084	Duluth-Superior Tr. Co.	1 m., Mar. '02	41,140	23,947	17,193	9,612	7,581
	1 " " '01	41,674	24,573	17,100	10,417	6,684		1 " " '01	33,212	21,238	11,974	9,105	2,869
	3 " " '02	141,134	86,335	54,799	-----	-----		3 " " '02	111,261	67,886	43,375	28,839	14,536
	3 " " '01	122,653	78,558	44,095	-----	-----		3 " " '01	94,763	59,623	35,141	27,286	7,854
	12 " Dec. '01	617,011	* 350,845	266,166	136,162	130,004	ELGIN, ILL.						
	12 " " '00	513,725	* 317,475	196,249	141,133	55,117	Elgin, Aurora & Southern Tr. Co.	1 m., Apl. '02	29,642	19,595	10,047	8,333	1,713
ALBANY, N. Y.								1 " " '01	26,613	18,285	8,328	8,333	+ 5
United Traction Co. ...	1 m., Mar. '02	115,652	86,131	29,521	23,453	6,067		11 " " '02	344,136	195,674	148,462	91,667	56,795
	1 " " '01	111,194	75,405	35,788	19,901	15,887		11 " " '01	300,962	192,726	108,236	91,667	16,569
	9 " " '02	1,098,699	756,239	342,460	192,220	150,240	HAMILTON, O.						
	9 " " '01	1,031,188	699,485	331,703	179,532	152,171	Southern Ohio Tr. Co.	1 m., Apl. '02	27,774	15,245	12,529	7,500	5,029
BINGHAMTON, N. Y.								1 " " '01	23,530	14,405	9,125	7,500	1,625
Binghamton St. Ry. Co.	1 m., Mar. '02	14,610	9,074	5,536	-----	-----		12 " " '02	353,144	186,365	166,779	90,000	76,779
	1 " " '01	14,137	8,737	5,399	-----	-----		12 " " '01	303,704	166,757	136,946	90,000	46,946
	9 " " '02	155,621	85,026	70,595	48,498	22,097	LONDON, ONT.						
	9 " " '01	140,084	75,794	64,290	44,384	19,906	London St. Ry. Co.	1 m., Mar. '02	10,233	6,691	3,542	2,313	1,230
BOSTON, MASS.								1 " " '01	9,295	6,563	2,731	2,032	699
Boston Elev. Ry. Co.	12 m., Sept. '01	10,869,496	7,336,597	3,532,899	2,896,359	636,539		3 " " '02	29,246	20,328	8,918	6,560	2,357
	12 " " '00	10,236,994	6,828,110	3,408,884	2,932,839	476,044		3 " " '01	26,696	19,137	7,559	5,809	1,750
Massachusetts Elec. Cos	12 m., Sept. '01	5,778,133	3,915,486	1,862,648	937,206	925,442	MILWAUKEE, WIS.						
	12 " " '00	5,518,837	3,659,337	1,859,500	994,294	865,206	Milwaukee El. Ry. & Lt. Co.	1 m., Mar. '02	216,642	101,062	115,580	65,699	49,881
BROOKLYN, N. Y.								1 " " '01	188,481	99,917	88,564	61,020	27,544
Brooklyn R. T. Co.	1 m., Feb. '02	861,696	* 716,432	145,264	-----	-----		3 " " '02	627,500	302,122	325,378	193,793	131,585
	1 " " '01	843,334	* 584,461	258,873	-----	-----		3 " " '01	544,473	301,432	243,041	180,681	62,360
	8 " " '02	8,395,448	* 6,016,664	2,378,784	-----	-----	MINNEAPOLIS, MINN.						
	8 " " '01	7,899,101	* 5,150,406	2,748,694	-----	-----	Twin City R. T. Co.	1 m., Mar. '02	279,383	127,960	151,423	58,517	92,906
	12 " June '01	12,135,559	* 7,216,008	4,919,551	4,341,748	577,803		1 " " '01	242,214	115,896	126,317	53,763	72,552
	12 " " '00	11,768,530	* 7,106,373	4,662,177	4,135,405	526,772		3 " " '02	796,322	380,651	415,670	175,550	240,120
BUFFALO, N. Y.								3 " " '01	694,067	337,581	356,485	159,793	196,692
International Tr. Co. ...	1 m., Feb. '02	230,744	132,920	97,824	94,276	3,548	MONTREAL, CAN.						
	1 " " '01	235,021	118,273	116,748	84,411	32,338	Montreal St. Ry. Co. ...	1 m., Mar. '02	156,876	103,846	53,030	16,176	36,854
	8 " " '02	3,519,491	1,664,285	1,855,206	789,124	1,066,081		1 " " '01	141,495	98,373	43,122	9,261	33,861
	8 " " '01	1,998,050	972,319	1,025,731	641,057	381,674		6 " " '02	924,720	595,607	329,113	90,387	238,736
CHICAGO, ILL.								6 " " '01	868,023	559,649	308,373	55,075	253,298
Chicago & Milwaukee Elec. Ry. Co.	1 m., Mar. '02	10,954	5,873	5,081	-----	-----	NEW YORK CITY.						
	1 " " '01	8,636	5,807	2,829	-----	-----	Manhattan Ry. Co.	3 m., Dec. '01	3,038,435	1,404,971	1,633,465	753,135	880,329
	3 " " '02	31,692	17,705	13,987	-----	-----		3 " " '00	2,728,598	1,340,696	1,387,902	749,857	638,045
	3 " " '01	23,599	17,030	6,569	-----	-----		12 " Sept. '01	10,455,872	5,328,649	5,127,223	2,682,132	2,444,091
								12 " " '00	9,950,735	5,195,312	4,755,423	2,688,644	2,066,779
							Metropolitan St. Ry. ...	3 m., Dec. '01	3,887,936	1,723,972	2,143,964	1,151,140	992,824
Lake Street Elevated	12 m., Dec. '01	786,462	388,799	397,663	-----	-----		3 " " '00	3,786,030	1,699,649	2,086,381	1,138,467	947,914
	12 " " '00	757,954	378,661	379,293	-----	-----		12 " June '01	14,720,767	6,755,131	7,965,636	4,534,068	3,431,567
CLEVELAND, O.								12 " " '00	14,437,134	6,631,254	7,805,880	4,445,720	3,360,160
Cleveland & Chagrin Falls	1 m., Feb. '02	3,454	2,255	1,199	-----	-----	OLEAN, N. Y.						
	1 " " '01	2,435	3,016	4,581	-----	-----	Olean St. Ry. Co.	1 m., Mar. '02	3,994	2,411	1,584	1,146	438
	12 " Dec. '01	47,976	* 32,002	15,974	13,023	2,951		1 " " '01	3,835	2,043	1,792	1,187	604
	12 " " '00	49,646	* 33,272	16,374	13,294	3,080		9 " " '02	41,735	21,611	20,124	12,343	7,781
								9 " " '01	39,270	19,276	19,994	11,068	8,925
Cleveland & Eastern	1 m., Feb. '02	4,916	3,616	1,300	-----	-----	PITTSBURG, PA.						
	1 " " '01	3,525	4,037	4,512	-----	-----	Consolidated Traction	1 m., Dec. '01	304,669	140,941	163,728	91,548	72,180
	12 " Dec. '01	90,390	52,022	38,368	43,678	4,310		1 " " '00	277,439	109,069	168,370	89,807	78,563
	12 " " '00	62,893	36,672	26,221	36,148	4,927		9 " " '01	2,649,656	1,145,651	1,503,905	807,667	694,238
Cleveland El. Ry. Co. ...	1 m., Feb. '02	168,462	97,446	71,016	22,170	48,846		9 " " '00	2,471,696	1,013,246	1,458,456	790,704	658,752
	1 " " '01	151,805	90,251	61,554	18,875	42,679	PHILADELPHIA, PA.						
	2 " " '02	356,544	203,452	153,092	43,945	109,146	American Ry. Co.	1 m., Apl. '02	79,619	-----	-----	-----	-----
	2 " " '01	318,537	189,514	129,023	37,851	91,172		1 " " '01	64,339	-----	-----	-----	-----
	12 " Dec. '01	2,296,898	1,265,953	1,030,945	244,231	786,714		10 " " '02	810,663	-----	-----	-----	-----
	12 " " '00	2,061,505	1,121,037	940,467	258,483	681,984		10 " " '01	691,399	-----	-----	-----	-----
Cleveland, Elyria & Western	1 m., Mar. '02	22,071	12,969	9,102	-----	-----	RICHMOND, VA.						
	1 " " '01	17,425	10,836	6,589	-----	-----	Richmond Trac. Co. ...	1 m., Sept. '01	20,991	15,669	5,322	3,196	2,126
	3 " " '02	57,084	38,369	18,715	-----	-----		1 " " '00	20,727	10,770	9,957	3,843	6,115
	3 " " '01	47,030	33,873	13,156	-----	-----		12 " " '01	218,569	139,542	79,027	38,618	47,210
	12 " Dec. '01	249,260	136,865	112,334	57,023	55,371		12 " " '00	108,198	108,198	94,859	37,608	50,250
	12 " " '00	179,698	102,393	77,304	34,562	42,742	ROCHESTER, N. Y.						
Cleveland, Painesville & Eastern	1 m., Mar. '02	12,867	6,892	5,975	-----	-----	Rochester Ry.	1 m., Mar. '02	91,759	47,468	44,292	24,851	19,437
	1 " " '01	9,537	5,312	4,225	-----	-----		1 " " '01	87,075	55,583	31,492	24,278	7,214
	3 " " '02	31,986	19,207	12,779	-----	-----		3 " " '02	264,660	146,932	117,728	74,375	43,353
	3 " " '01	26,019	15,675	10,343	-----	-----		3 " " '01	246,054	161,877	84,177	72,694	11,483
	12 " Dec. '01	164,971	* 87,102	77,869	72,500	5,369	SCRANTON, PA.						
	12 " " '00	141,112	* 89,592	71,520	72,500	† 980	Scranton Ry. Co.	1 m., Oct. '01	2,638	29,300	26,661	-----	-----
DENVER, COL.								1 " " '00	48,781	34,787	13,993	-----	-----
Denver City Tramway Co.	1 m., Mar. '02	124,464	65,533	58,931	32,747	26,184		10 " " '01	507,989	295,079	212,910	-----	-----
	1 " " '01	112,126	60,562	51,564	31,304	20,259		10 " " '00	504,852	298,122	206,730	-----	-----
	3 " " '02	356,832	194,585	162,247	98,394	63,853	SCHENECTADY, N. Y.						
	3 " " '01	318,940	174,049	144,891	94,318	50,573	Schenectady Ry. Co. ...	3 m., Dec. '01	84,061	46,949	37,112	13,454	23,658
	12 " Dec. '01	2,919,171	* 1,596,765	1,322,046	652,277	670,129		3 " " '00	30,876	14,517	16,359	6,087	10,272
	12 " " '00	1,302,290	722,458	57									