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Contents of this Issue

The Electrolysis Decision in Dayton

The long-delayed decision in the suit of the City of Dayton vs. the City Railway Company, of Dayton, and popularly known as the "Dayton electrolysis case," was rendered April 5 by Judge O. B. Brown, and is published elsewhere in this issue. The importance of this case, the number and standing of the experts called to give testimony, and the great interest which has been taken in the entire question, justify, we believe, the space occupied by the decision in this issue. Judge Brown has certainly displayed great legal and electrical ability in his consideration of the principles under which railway companies are operated; and while the decision is against the railway company, the conclusions reached by the court may fairly be considered to be a victory for it and for railway interests in general. This is shown by the three findings of the court, which are briefly: (1) That the court has no authority to compel a change from the single to the double trolley system, which was one of the demands of the plaintiff, and if such a change was warranted by law the facts in the case would not justify the court in ordering it; (2) the trouble of which complaint was made was caused by a negligent operation of the road, for which there is no excuse in law and which should be remedied by better bonding and other improvements required by the best electrical knowledge; (3) in making such improvements for a better track return the co-operation of the plaintiff is recommended. This is entirely along the line upon which a decision could have been expected, and the fact that the court holds that intelligent electrical engineering, coupled with co-operation on the part of the owners of the water system, will entirely obviate any trouble in the future is exactly the position which we have always taken and which was expressed in an editorial on this subject in our last issue. It might be said in explanation of the "negligent operation of the road" that the attorneys for the railway company admitted that in many respects the condition of the system during the last few years might have been improved. The company was unwilling to go to any expense in this direction, however, until the status of its use of the single-trolley system, which was then being assailed, had been determined.

"Fishing for Suckers"

Mr. Tom Johnson is always an interesting, engaging and attractive personage, and when he enlarges on street railways he always has something to say that goes well in print. The bearing of his remarks, however, lies a good deal in the application, as Captain Cuttle would say, and possibly Mr. Johnson would not agree to all the implications. We note the following remarks of his before the Ohio House committee on municipal affairs, in favor of the pending bills for municipal ownership of street railways:

> I will give you my recipe for running street railways. I never asked for a franchise or begged leave from a Council to occupy streets. I always looked for a city where there was a street railway, bought it from the owners and reduced the fare. I always bought my properties from men who didn't know the value of the property they had to sell. I went fishing for suckers and caught them. I never bought a road that didn't make money, and I made enough to get out of the business altogether. That, gentlemen, is my street railway recipe in a nutshell. I am not a philanthropist, but I am always looking out for the best, just like you people.

Now this can be looked at from various standpoints. Mr. Johnson does not mean that he operated his roads without a franchise. All he did was to let other people get the franchises first. It may have been a hard job, but that was their lookout. They were only "suckers," anyhow. But now, having made a fortune out of street railways—operated always under franchise—Mr. Johnson turns around and insists that the other set of suckers who buy such properties shall be subject to a destructive stand-and-deliver policy which aims to drive them out of the industry or compel them to do business at a loss. We fear that both sets of "suckers" will be inclined to accept Mr. Johnson at his own valuation, namely, that he is not a philanthropist.

Settlement of New Orleans Controversy

The experience of the street railway companies of New Orleans last month furnishes an excellent lesson to those who have to deal with the labor problem, especially where large bodies of men are employed and irresponsible and self-appointed leaders assume to represent them. As has already been noted in our news columns a serious strike was happily averted in spite of the fact that the men were supposed to be greatly dissatisfied, and that they were assured the support of other labor organizations of the city. The trouble was caused by an attempt to secure "recognition of the union," which really meant that every employee must join the organization within sixty days or leave the service of the street railway companies. There were other specifications, but they were entirely lost sight of, and it was upon this point that the fight was really made. When the demands of the agents for the organization were made known the companies lost no time in stating their position clearly, concisely and emphatically, in a letter to the association. The clause in this letter, which covers the ground in dispute, and which was signed by the presidents of all the street railway companies in New Orleans, reads as follows:

> Your association proposes not only to interpose itself in all matters of management between these companies and their employees; to restrict them in their right to employ men outside of that association, or to discharge a conductor, even if convicted of embezzling fares, but it arrogates to itself the power to continue or, inferentially, to discontinue the operation of these railways. These pretensions are an insult to these companies and to this community, and your association, in making them, openly proclaims itself an enemy to private and to public rights. We decline, therefore, to recognize your association and to discuss with it the affairs of these companies, or the relations existing between them and their employees.

It required no intermediary to interpret this decision of the companies; it was presented frankly and firmly, and it must have greatly impressed the men, for they immediately opened negotiations as employees, and, of course, were received courteously by the companies. It was readily agreed that whenever the men had any complaints to make as employees, they would be accorded fair treatment, but they would not, under any circumstances, be received as representatives of an organization. Other points were adjusted without difficulty, and this "compromise" was submitted to the body of the men for approval. It was decided to determine the question by secret ballot, thus ensuring to every man an opportunity to record his deliberate judgment. The result justified the claims of the companies that the men, as a body, were satisfied with their treatment and did not desire a strike. A secret ballot was taken on the question by the men and out of 1300 members of the union employed on the street railway lines of New Orleans, only 176 voted in favor of a strike. This was rather a farcical finish, in view of the fact that the entire city had been in a turmoil for a month, and that during this time it was confidently declared by the agents who were busily engaged in fomenting strife that the men were united in their demands, thoroughly organized and prepared for a long siege. It is worthy of consideration in this connection that several prominent labor organizers advised a conservative course, and, finding the companies' terms fair to the men, early recognized the utter hopelessness of a strike and used their influence in averting it.

But the chief factor in determining the struggle was the positive attitude of the companies from the beginning. They recognized their responsibility to the community and they determined to discharge their duty fearlessly and fully. They appealed to the judgment of the people, and, in spite of the common prejudice against corporations and the sympathy for workingmen that is generally expressed indiscriminately on such occasions, it was universally recognized that the companies were simply guarding public and private rights when they refused to accede to the original demands and that they were thus performing a very valuable public service. Consequently they were upheld, and undoubtedly the men themselves recognized this condition, even though their so-called leaders refused to admit it, and they governed their actions accordingly. All are, therefore, to be congratulated upon the outcome of this controversy.

Speed Regulations for the Automobile

The old electric railway man, he who cut his wisdom teeth on Sprague No. 5 motors, and the trolley that was moored to its pole with a bit of clothes line, smiles inwardly at the rumpus now being stirred up over the skittish horse and the automobile. He remembers the good old times when irate citizens hung on to the reins and consigned the new-fangled motive power to destruction, when City Councils voted to prohibit speeds greater than 6 miles an hour and rural Boards of Selectmen worked themselves into a fine bucolic frenzy and ordered up the tracks. But the world wags along and one has to get out a search warrant for a horse who will do more than cock an inquisitive ear backward as the rushing car overtakes him. Just now the automobilist is having his share of the same trouble, and apparently he does not like it—it delays the game and cuts down his running time wofully. He is therefore putting up the most naïve argument that he has found, that the best way to allay the fears of a frightened horse is to dash by at full speed and get out of sight as quickly as possible. We believe also that he has found the same process efficacious after running over a pedestrian. But, while horses will doubtless get used to the automobile in due season, it will be a much slower process than it was in case of the street car. For the car presents an appearance not altogether unwonted and keeps steadily to a definite track, on which a horse soon finds that it may reasonably be expected. The automobile, however, is coming to resemble nothing else that moves on the earth or through the waters under it, and any right-minded quadruped has a right to shy at its appearance. It will all come out right in the end, doubtless, but meanwhile we cannot restrain a little innocent merriment over the situation. As David Harum pleasantly remarked: "It's a good thing for a dog to have a few fleas—keeps him from brooding on bein' a dog."

As to Through Cars

We wonder whether our friend the general manager often finds time to consider the through-car question in all its aspects and its important bearing on traffic. Very few systems now a days are isolated in the sense that they have no connections with other systems, and in a large majority of cases these connections mean the possibility of interurban traffic. And this being so, in how many instances is a determined effort made to operate two contiguous systems in complete harmony? It is very instructive to examine the connections that go to make up a long trolley ride with an eye out for the possibilities of unified action. The modern tendency toward open consolidation is a recognition of one phase of the case, but leaving this out of the question, there is a chance for most useful and profitable work in building up through lines. In several cities in the West, notably in Chicago, this question has received serious consideration, but because of the uncertainty regarding franchises, the problem has not been completely solved. In New England, however, there are numerous examples. The cars between New Haven and Bridgeport operate over three lines in the system of through interurban traffic. At the present day no subject can be studied to greater advantage by street railway managers than the history and principles of general railroading. All the important questions relating to the traffic have been threshed over by steam railroad men years ago and their experiences ought to be heeded.

About the first lesson that had to be learned was the art of dealing with through traffic which must be carried over the lines of several systems. It very early became evident that a change of cars in passing to a foreign line was bad tactics, and the interesting spectacle has often been presented of two roads actually on bad terms with each other, still making punctiliously accurate connections, and forming traffic agreements with every appearance of amicability. Now street railways have even more cogent reasons for working in harmony, for nearly every interurban connection brings the electric lines in direct and often fierce competition with steam roads. The latter generally have the advantage in speed,

and unless the electric roads work in full harmony, and with the value of through traffic in mind, this advantage is greatly increased by the effect of bad connections. Take, for example, two cities 50 miles apart. The railroad between them may run a train every two hours and take two hours for the trip. The electric systems between the same termini may number three or four, running cars on fifteen minutes' and thirty minutes' headway, and making, perhaps, 10 miles per hour. The apparent running time of five hours would, in practice, be extended to six hours or more by uncertain connections and whatever through traffic might be secured would be almost wholly in summer. If the managers of the electric roads, however, really put their heads together and settled upon a plan of campaign, they could put up a combination that would produce an effect on next year's passenger receipts.

The first step would be to lay out a through schedule, based on the best running time that could be made. One of the component roads, perhaps, might operate only two cars an hour, but these can be made to count for considerable. The parties to the conspiracy would then proceed to arrange to send out through cars over the line every hour or half hour under trackage arrangements between the parties. It might prove desirable to change operators so as to ensure its local receipts to each road, but the main point would be to take the passengers from terminus to terminus without change of cars or waiting at junctions. By selecting the rolling stock with a little care, the actual running time could be materially reduced, and the result would surely be the building up of long-distance traffic to a point that would prove profitable to all parties concerned. Each local situation has its own conditions, and in many instances the average haul would be considerably less than the 50 miles assumed in this example, but the principle of united action for through service is everywhere and always valuable. Actual consolidation has its own especially good and bad points, but some of its most characteristic advantages can be secured merely by rational co-operation.

Municipal Ownership Vote in Chicago

Every voter who went to the polls at the city election held April 1 in Chicago was handed a ballot upon which he was privileged to mark his assent or dissent to certain questions of public policy. Among these was the question of municipal ownership of street railways. The result of the vote was 124,594 in favor of and 25,987 against municipal ownership. No statement was made in the question as printed on the ballot as to whether municipal ownership and operation, or municipal ownership of tracks with a lease to a private corporation, was desired. Aside from this indefiniteness as to the exact desires of the majority the result of the vote was certainly most decisive and came as a surprise to both friends and opponents of the policy. To understand fully the result of this vote it is necessary to study Chicago local affairs for some time back. This done, the vote is not so hard to understand, and as street railway men the country over are interested in the result of the Chicago vote as being among the first of its kind in this country, and as it will as such attract considerable attention, it is worth while here to recount some of the main points.

In the first place, the vote did not mean, nor could it mean, any immediate assumption of street railway ownership on the part of the city. The city has no power to own or operate street railways under the present Illinois laws, and enabling legislation must be passed before it can. The vote was taken simply as an expression of the sentiment of the voters as to the future trend of public policy. Among those voting for the proposition there were three classes of voters: first, those thinking people who conscientiously believe that municipal control should be extended to street railways ultimately and that in the course of time municipal governments will have become so purified as to be capable of the trust; second, those who have no decided preferences one way or another, but who voted for municipal ownership rather because of a disinclination to oppose the plan than on account of any positive convictions in its favor; third, those of both ignorant and educated classes who are dissatisfied with present conditions and who would vote for anything in the nature of a change without giving the matter thought. Of the latter class there are always a considerable number at any election, and that it was a large number in the recent Chicago vote those know who are familiar with local conditions in Chicago at the present time. What has led up to the dissatisfaction is another story, but has an important bearing on the question under discussion. For some years past the Chicago companies have been under the necessity of suspending much-needed improvements on a number of main or trunk lines, pending either a renewal of their franchises on these lines on satisfactory terms or a decision of the court giving them rights on those streets under the ninety-nine year act. The situation has not been made any easier by the presence of a Mayor whose sole aim in life seems to be to block all progress toward a settlement of the question. In the absence of assurance as to the continuity of some of the most important franchises the companies have done the best they could with present equipment and downtown terminals by adding to the car service as much as the present cables and terminals would permit. In the meantime the advent of prosperous times and heavy travel increasing steadily, matters went from bad to worse. Insufficient franchises for overhead trolley lines in the downtown district limited the number of people that could be handled that way, and the cables were loaded to the limit of safety. No one realizes the unsatisfactory condition of affairs better than the companies themselves; but until extensions are granted which will warrant a wholesale reconstruction of downtown street railway facilities and the introduction of electric in place of cable traction there can be no relief expected. The general feeling of dissatisfaction with the present service, without thought as to its cause, is no doubt responsible for a large percentage of the vote in favor of municipal ownership, on the same principle as the farmer who was always "agin' the government" whatever else he believed in. It is interesting to note that there does not seem to be the unanimity of opinion on the part of the Chicago press as to the advisability of municipal ownership of street railways that one would expect after such a vote. When a paper like the Chicago *Tribune* editorializes in the following manner the day after election it does not indicate that there is such intense public feeling on the subject as a perusal of the election returns might indictate to a non-resident of Chicago. The *Tribune* says:

> If it takes a municipal corporation fifteen days or more to make bridge repairs which ought to be made in three days, how long would it take a municipal corporation operating a street railroad to make repairs which a traction company rushes through in from one to three hours? Doubtless the municipal corporation would be as dilatory in the one case as in the other. Chicagoans need the unobstructed use of the bridges. Quite indifferent to that fact, city employees have been puttering and dawdling about Clark Street Bridge, and have managed to put the people who wish to use it to an extraordinary amount of inconvenience. No regard whatever has been shown for the rights of the public. There never is where public works are concerned. The object is to make a job last as long as possible. Chicagoans, who have the ever-present spectacle of the slothful ways of city employees, are not in favor of the proposed extension of the sphere of municipal inefficiency so as to take in street railroads. The service on the Chicago lines is bad enough, but it would be infinitely worse if these lines were operated by the city. So, whenever an accident stopped the working of a line, the fact that tens of thousands of people would be incommoded while necessary repairs were being made would not hasten the motions of the city employees sent to attend to the matter. They would go about their work in their customary slouching, easy-going way and whistle while the people walked. The servant who was faithful over a few things was made ruler over many things. When a municipal corporation shall have shown its ability to do well the things now given it to do there will be a good reason for assigning additional duties to it. A municipal corporation which never is able to make bridge repairs promptly is not to be trusted with the operation of an electric street railway.

It might be added that the experience of the city of Chicago in establishing and operating a municipal street lighting department has not been entirely satisfactory; as a matter of fact the service is poor as compared with the commercial lighting furnished merchants and householders, and it is expensive, too, as has been shown. The tendency of the municipal officers to juggle statistics so as to convey the impression that the street lighting was less expensive than commercial rates has been exposed and publicly rebuked on several occasions by local newspapers.

Snowstorms in Western New York

The severe snowstorms which have visited Central and Western New York during the last winter have caused the street railway companies considerable trouble and expense. This was especially true of the first half of February. On the Rochester & Sodus Bay Railway Company's lines the crews were constantly at work, but they had the satisfaction of keeping the line open.

The accompanying illustrations give a fair idea of the conditions which confronted the management. Figs. 1 and 2 show the rotary plows at work, Fig. 3 shows the top of a trolley car that is practically "snowed in," while Fig. 4 shows a cut through the snowdrift that rises to the roof of the car. The illustrations give a fair idea of the situation. E. J. Wilcoxen, superintendent of the company, says:

"From Feb. 1 to Feb. 15 we experienced our regular February storms, the drifts averaging 3 ft. to 12 ft. We were able to get cars over our line (40 miles) every day except one, although our competitor—the steam road—was unable to do as well. Our snow equipment consists of two rotary plows. While the Ohio Traction Company, whose experiences were noted in your issue of March 22, used 200 men as shovelers, our two rotaries required only six, leaving our regular section force of ten men to look after the switches."

The accompanying engravings give a better idea than any description could do of the size of some of the drifts encountered on this line during the last winter season, and it is doubtful whether any other electric railway can make a showing equal to that of the Rochester & Sodus Bay line. For work of this kind it is difficult to imagine any machine more efficient than the rotary snow plow, and the fact that two of these plows kept 40 miles of line open for practically the entire season, is an excellent testimonial to its ability as a snow fighter.

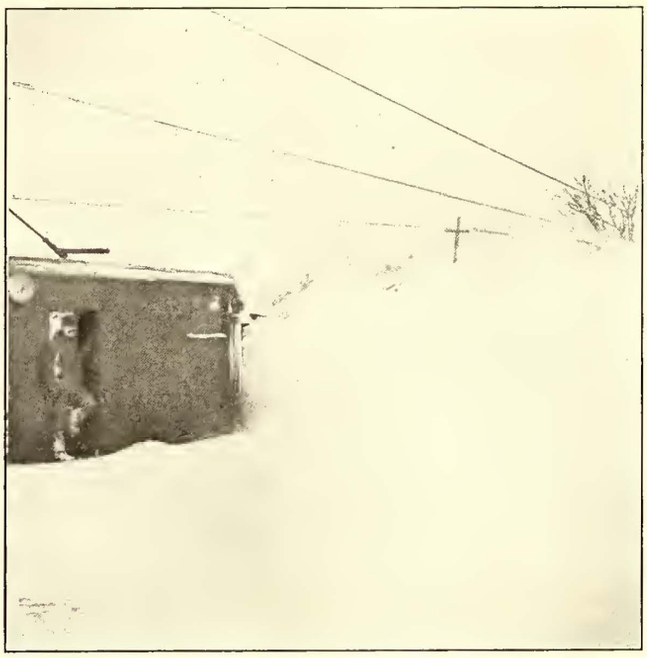


FIG. 1.—ROTARY PLOW AT WORK

FIG. 2.—ROTARY PLOW AT WORK

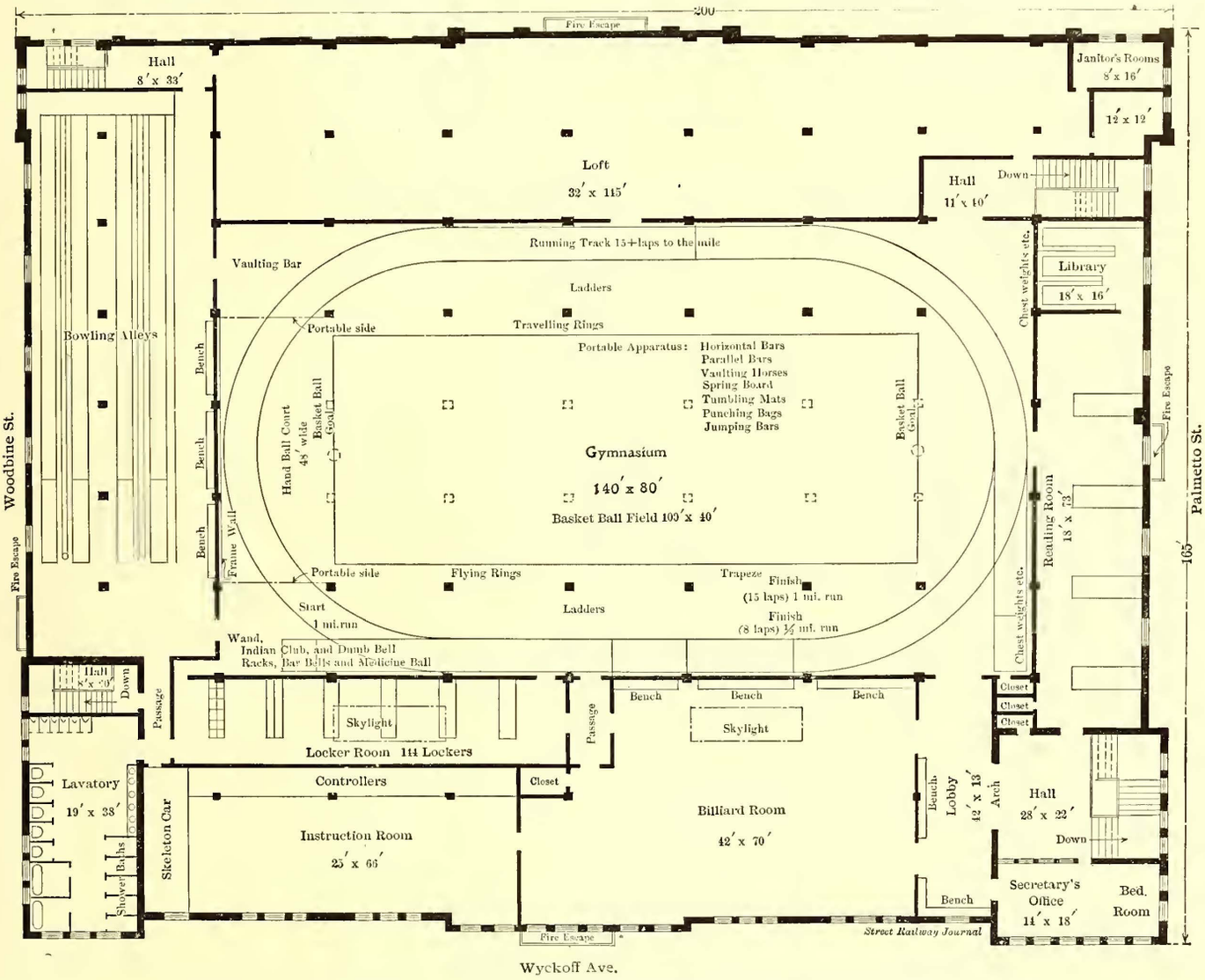
FIG. 3.—STALLED IN A DRIFT UP TO THE EAVES

FIG. 4.—A CLEAR TRACK

The Pittsburgh & Lake Erie Railway (steam) has reduced its rates between Youngstown and New Castle, to meet the competition of the new extension of the Mahoning Valley Railway Company.

Benefit Association of the Brooklyn Rapid Transit Company

While it is undoubtedly one of the greatest problems in street railway operation to obtain good men for the service of the company, it is of equal importance that these men should be made contented with their positions. With this idea in mind nearly all the roads, both large and small, have taken considerable pains and gone to no little expense to create more beneficial social relations between the men when off duty and provide forms of recreation



PROPOSED PLAN OF BROOKLYN RAPID TRANSIT COMPANY'S BENEFIT ASSOCIATION'S ROOMS

which will prevent their being dissatisfied with their employers. Ever since coming to Brooklyn last year President J. L. Greatsinger, of the Brooklyn Rapid Transit Company, has been working toward the betterment of the social condition of his men, a work which was not only extremely pleasant to one of his temperament, but one with which he had become familiar during his days of railroading in the West, where he left one of the most complete systems of railroad mutual benefit associations to be found in the world. With the able assistance of W. W. Wheatly, superintendent of the surface lines, plans have been formulated which will give to the men employed by the Brooklyn Rapid Transit Company a benefit association which bids fair to rival the one which President Greatsinger produced on his Western road. Being firm believers in the association of employees as a practical force among railway men, and a beneficent undertaking for both employer and employed, the officers of the Brooklyn Rapid Transit Company, from General Manager J. C. Brackenridge down, have gone into the matter with hearty co-operation, and a large amount of time has been spent in perfecting the plans of suitable meeting places and organization, which is shortly to be followed by the expenditure of considerable sums of money. The company has been most successful in obtaining the services of J. M. Dudley as secretary of the association. Mr. Dudley has come from Chicago and is a practical railway man, having been for five years a brakeman and conductor on the Chesapeake & Ohio Railroad, and later having gone to Toronto, Can., where he was in railroad association work for two years before going to Chicago. In the latter city he was employed in the same class of work for three years.

The proposed plan shown herewith gives an excellent idea of the extensive scale upon which the work is to be laid out. This plan is of the second floor of the Ridgewood car house as it will appear after being remodeled to meet the requirements of the association. This place will serve the double purpose of being a meeting center for railway men and affording facilities for the instruction of conductors and motormen in the performance of their duties. The plans provide for reading room, club room, gymnasium, bowling alleys, class room, assembly hall, bath rooms, restaurant and possibly a few sleeping rooms. The reading room will be 18ft. x 73 ft., well lighted, ventilated and furnished with comfortable chairs, liberal supplies of papers and magazines, scientific and popular. Four billiard tables and other games will be provided for the club room, which is 42 ft. x 70 ft. facing Wyckoff Avenue. The bowling alleys exactly meet the need of furnishing light bodily exercise and affording the fun element demanded by the men released from close application to business duties.

Social gatherings and entertainments for employees and their families may be held in the large hall, which has a seating capacity of 1000. In the rear of the hall a skeleton car is to be placed for the instruction of conductors and motormen. The skeleton car will be fully equipped with the same character of apparatus as is used in the regular service. All of the parts, including the motors, and all of the mechanical details of the car, will be exposed to view, so that the men receiving instruction can have a practical demonstration of the entire apparatus. A competent instructor will be in charge of this department.

Plans have been made for a restaurant in which good food will be furnished at low price. The baths and lavatories will be of the

best modern type, shower baths replacing the tubs, as in most associations. The secretary's office will be near the entrance to the building, to enable him to greet and get acquainted with the men who frequent the club rooms and to welcome newcomers.

Work will begin at once on the remodeling, and the club rooms will be ready to open in a few months. In addition to the central department, there will be a number of association club rooms at other car houses, at Crosstown, Flatbush, Ninth Avenue, East New York, Fifty-Eighth Street, Bergen Street and Canarsie, but the headquarters will be at Ridgewood. At present good rooms are provided at Crosstown, Flatbush and Ridgewood car houses. In each case there is a large reading room, billiard room and locker room. Bowling alleys are provided at Crosstown and Ridgewood club rooms.

The same relation will exist between the Street Railway Association and the Brooklyn Young Men's Christian Association that exists between steam railroad departments and city associations. This gives the movement stability and the benefit of years of experience of the Brooklyn Y. M. C. A. Besides the use of the gymnasiums, circulating library, etc., the members of the club receive free medical attendance in case of illness and financial aid to themselves in case of enforced absence from duty or to their families in case of death. In cases of illness or injury $1 per day is paid for each day the member is unable to perform his duties, and in case of death $150 is given to the heirs of the deceased. It is intended that a physician will be in attendance at the benefit association's headquarters three days per week for three or four hours of those days. This physician will be ready at these times to give medical treatment and advice to all such members as are perhaps not ill enough to lay off, as well as passing on those who think they need to go on the sick list. Besides this physician, who will be chief of the medical department of the association, a large number of physicians throughout the city will be engaged to attend to the employees who live in their neighborhood.

The Brooklyn Rapid Transit Company guarantees the financial integrity of the benefit association. While it has already expended large funds in fitting up the present club rooms, it will enlarge the facilities found there, as well as equipping the new Ridgewood Avenue headquarters. The general manager of the Brooklyn Rapid Transit Company, according to the charter of the association, will be the permanent head of the association, and will also be chairman of the board of trustees, which will govern all matters pertaining to the policy of the association. This board of trustees will consist of seven men, including the chairman, three of these being elected by the members and three being appointed by the president of the Brooklyn Rapid Transit Company. The secretary and treasurer will be appointed by the Brooklyn Rapid Transit Company, and will receive his salary from the treasury of the company. The vice-president of the association will be elected by the members. Besides paying the salary of the secretary, the railway company furnishes the rooms and equipment free of cost, and provides light, heat, water, etc. The dues of the association will be $1 initiation and fifty cents every month, and all employees of the Brooklyn Rapid Transit Company in good standing, whether they work on the elevated lines, surface lines or in the power stations or shops, will be eligible for membership.

Clever Detective Work in Brooklyn

Having suspected for some weeks that an organized band of swindlers among its own employees was robbing the Brooklyn Rapid Transit Company, the officers of the company have been quietly running the offenders down. The operations of secret service men in their employ culminated last Saturday in the summary dismissal of fifteen conductors on various lines of the company and the arrest of one Charles Gold, a former conductor on the Myrtle Avenue line. Gold will be accused of acting as a "go-between" in the relations of one dishonest conductor with another, carrying bundles of transfer tickets from one to the other at points of intersection, and thus enabling the conductor who received the tickets, which in Brooklyn are rung up the same as cash fares, to turn in paper instead of cash. It was quite possible, under the circumstances, for all the conductors interested in the scheme to make from a dollar to a dollar and a half extra "wages" without reporting at the end of their run with more than a reasonable number of transfer tickets. The arrest of the go-between was made under the most satisfactory circumstances and his conviction is almost sure to follow. A detective who had been following him for some time was on the car platform with two officials of the railway company and saw Gold deposit a bunch of transfer tickets in the conductor's pocket. The Brooklyn Rapid Transit Company is to be congratulated on having at one time relieved from its force of employees fifteen dishonest men and arrested one of the smartest swindlers who has ever operated in Brooklyn.

Improvements at Birmingham

The Birmingham Railway, Light & Power Company, of Birmingham, Ala., now has under way improvements the aggregate cost of which will be about $1,750,000. The company is rebuilding a number of old lines, constructing one new line and converting others from steam to electricity. The capacity of the company's power plant is being increased, and arrangements are being made for the installation of a system of steam heating to reach all portions of the city.

One of the most important improvements being made by the company is the conversion of the Birmingham and Bessemer and Powderly and Bessemer steam lines into electric lines. The Birmingham and Bessemer line is twelve miles in length, while the Powderly and Bessemer line is seven miles long. The equipment of the two lines with electricity will complete a circuit by which electric cars can be run from Birmingham by one route and return by another, as there is at this time an electric line extending from Birmingham to Powderly. The Birmingham and Bessemer line is laid with heavy rails and will not have to be rebuilt, but the Powderly and Bessemer line is of light construction and will be rebuilt entirely.

The electric plant in Bessemer, a comparatively small concern, was bought by the company some time since, and, in connection with the equipment of the two above-mentioned lines with electricity, the Bessemer light plant is to be practically rebuilt on a much larger scale.

The present line between Birmingham and Ensley is being double-tracked the greater part of the way, and at the same time a second line is being built. This line follows an entirely different route and will open up a new territory. Work on it is progressing rapidly, and it will be placed in operation during the coming summer.

The East Lake line, which is a double-track system about 7 miles in length, is being practically rebuilt. Heavy rails are being laid and the roadbed is being greatly improved.

In the city proper the company is engaged in laying many blocks of 80-lb. and 90-lb. steel rails. Much paving is being done by the city, and the company is laying heavy rails wherever paving is being done.

Plans have been completed by the company for the erection of a monster car house and car shop in the city of Birmingham, and an entire block has been purchased for this purpose. The buildings will be exactly alike from an exterior point of view, and each will be 300 ft. x 140 ft. The car house will be equipped with every modern device for the care of cars, while the shop will have all necessary facilities for the repair and rebuilding of rolling stock. The buildings will be of brick, with cement floors, and will be fireproof. The total investment will be considerably over $100,000.

The addition which is being made to the power station will also cost an amount exceeding $100,000. The building is to be lengthened considerably, making the station cover almost an entire block, and the station output is to be greatly increased by the addition of two large engines. In addition to furnishing most of the power for the operation of the numerous railway lines which go to make up the system, this station supplies all the electricity used for lighting, heating and power in and about Birmingham. With the completion of the improvements now under way the company, as previously noted, will install a steam heating system which will reach throughout the business portion of the city. The steam will be conveyed through pipes and carried into buildings within a radius of seven blocks of the plant. About $100,000 will be expended in installing this system.

The company also owns the gas plant in Birmingham, and about $100,000 is to be expended in putting this system in the best possible condition. The productive capacity of the plant will be greatly increased and the pipe system will be extended in all directions.

In addition to the large contracts above referred to, the company is making many improvements which will necessitate large expenditures in the aggregate. Every line owned by the company is being put in first-class condition. The company was handicapped for years by the lack of funds with which to make needed repairs and extensions, but when the consolidation took place last year, and a large bond issue was authorized, there was ample money available, and this is now being expended with careful but unsparing hand.

The equipment is also receiving attention, and only recently twenty handsome new cars were put into service. These cars are 42 ft. long, are vestibuled at each end, have cross seats, are equipped with four motors, have air brakes, electric arc headlights and all other modern appliances. With the completion of the new line to Ensley and the conversion of the Birmingham and Bessemer and Powderly and Bessemer lines into electric lines, further additions will be made to the rolling stock.

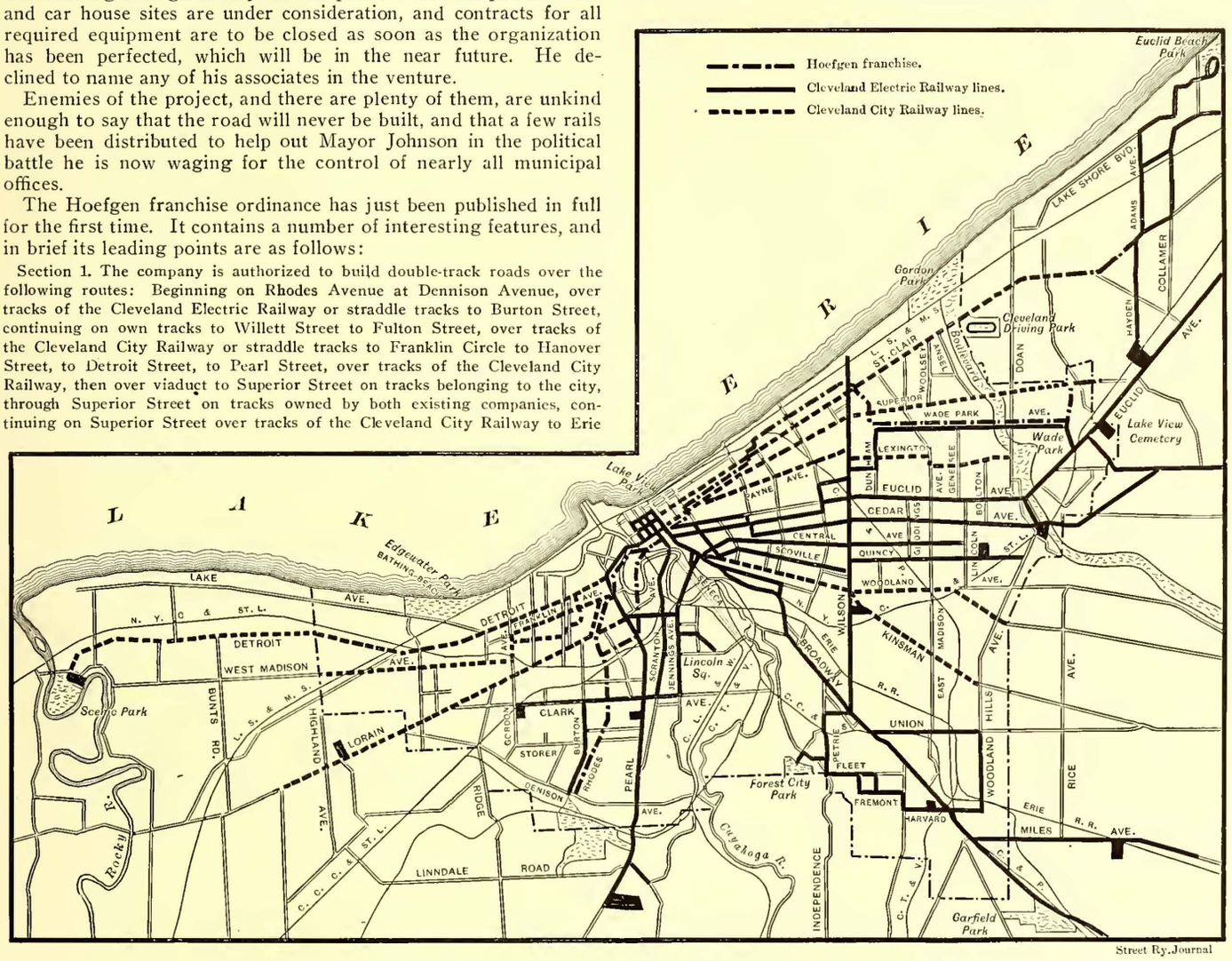
The Cleveland Situation

Evidence that actual work is about to start on the new system of the People's Railway Company, of Cleveland, popularly known as the Hoefgen three-cent fare line, is the fact that the company has received several carloads of rails, which have been distributed along the proposed route on Rhodes Avenue. The company has not yet been organized, and Promoter John Hoefgen retains the sphinx-like silence with regard to his plans that he assumed from the start. He was interviewed by a STREET RAILWAY JOURNAL man Saturday, and the best he would give out was that the company will commence construction work at once, contract for the work having been given to J. C. McSpadden. Several power house and car house sites are under consideration, and contracts for all required equipment are to be closed as soon as the organization has been perfected, which will be in the near future. He declined to name any of his associates in the venture.

Enemies of the project, and there are plenty of them, are unkind enough to say that the road will never be built, and that a few rails have been distributed to help out Mayor Johnson in the political battle he is now waging for the control of nearly all municipal offices.

The Hoefgen franchise ordinance has just been published in full for the first time. It contains a number of interesting features, and in brief its leading points are as follows:

Section 1. The company is authorized to build double-track roads over the following routes: Beginning on Rhodes Avenue at Dennison Avenue, over tracks of the Cleveland Electric Railway or straddle tracks to Burton Street, continuing on own tracks to Willett Street to Fulton Street, over tracks of the Cleveland City Railway or straddle tracks to Franklin Circle to Hanover Street, to Detroit Street, to Pearl Street, over tracks of the Cleveland City Railway, then over viaduct to Superior Street on tracks belonging to the city, through Superior Street on tracks owned by both existing companies, continuing on Superior Street over tracks of the Cleveland City Railway to Erie Street, through Erie Street on tracks of the Cleveland City Railway to Oregon Street, on own tracks to Oliver Street, to St. Clair Street, through St. Clair Street on tracks of Cleveland City Railway to Sterling Avenue, on own tracks to Hamilton Street, to Marquette Street, to East Stanard Street, to Bonna Street, to Norwood Street, to Wade Park Avenue, to Dunham Avenue, continuing on Wade Park Avenue over tracks of the Cleveland Electric Railway to Rosedale Street, over own tracks to Superior Street, over tracks of Cleveland City Railway or straddle tracks to end of existing tracks of said company and on to the city limits; also, beginning at corner of Monroe and Willett Streets, through Monroe Street to Pearl Street and over land belonging to the city to Columbus Street, to Center Street, to South Water Street, to Champlain Street, to Ontario Street, or through Champlain Street to Canal Street, to Michigan Street, to Seneca Street, continuing through Michigan Street over tracks of the Cleveland Electric Railway to Ontario Street, over tracks of the Cleveland City Railway to the Public Square; also, over the tracks of the Cleveland City Railway and the Cleveland Electric Railway around the loop formed by Bank Street, private right of way, Water Street and Superior Street.



MAP OF CLEVELAND, SHOWING EXISTING ROUTES AND NEW FRANCHISES

Sec. 2. Motive power to be electricity. Rails 90 lbs. to the yard; grooved rails to be used where city requires it. Cars to be equipped with electric, hydraulic or mechanical brakes.

Sec. 3. Grantee to have right to string necessary wires to power houses.

Sec. 4. Rate of fare to be three cents for each passenger. Five tickets for fifteen cents to be sold at all times. Transfers to be given to another line at all points of intersection. City reserves right to regulate issuance and use of transfers to carry out this provision, to establish transfer points and to require exchange of free transfers at such points between the lines of grantee and any other street railway company. Any child under 6 years accompanied to be carried free.

Sec. 5. Where tracks pass over streets already paved, grantee shall not be required to pay value of paving 16 ft., as required by statute.

Sec. 6. Wherever road is constructed over streets not in free territory, but occupied by another company, the grantee shall have right to construct straddle tracks, said tracks to be removed when arrangement for joint use of tracks can be made.

Sec. 7. In case of controversy with employees, each side of controversy shall appoint two persons, whose actions shall be final. If this board fails to agree, the Mayor shall become the fifth member, and a majority vote shall decide. No employee shall work more than ten hours, within limits of fourteen hours, in any twenty-four hours except in case of emergency causing obstruction of traffic.

Sec. 8. The Council reserves the right to purchase the property when it may have the right to do so for such price as may be agreed upon between the two parties. In case of disagreement as to terms, the matter to be left to a board of arbitration consisting of three persons; majority to rule.

Sec. 9. In case of arbitration in the matter of purchase, the city shall give six months' notice of its intention to arbitrate, and shall name one arbitrator. The owner shall within thirty days name one arbitrator, and the two shall then agree upon a third within thirty days. In case of failure of owner to name an arbitrator, or the two to name a third, the probate judge shall name one or both arbitrators upon the application of the city.

Sec. 10. The value of the property shall be obtained as follows: Cost of reproduction to be estimated, allowing a reasonable amount for depreciation. All property of any nature used in the operation of the road shall be included. Separate itemized schedules under the following heads: Land; power houses, including buildings and machinery; all other buildings; tracks; pavements paid for by company; rolling stock; miscellaneous. To the total valuation of the above items shall be added 10 per cent. Franchises granted by the city not included.

Sec. 11. The city reserves the right to decline the proposition, in which event no new demand to be made within two years. Whenever, after ten years, the net earnings of the road exceed 8 per cent on the actual bona-fide value, irrespective of the capitalization, the company shall pay one-half of net earnings in excess of 8 per cent to the city, whether said earnings are applied to interest, surplus, dividends or extensions. And for the purpose of ascertaining said value, the procedure mentioned in section 10 shall obtain, unless the parties agree.

Sec. 13. In addition to the above, the city reserves the right to authorize any other company to jointly occupy any part of the tracks on Oregon Street, be-

tween Oliver Street and Erie Street, upon such conditions as the city shall decide unless the parties themselves agree.

Sec. 14. At the expiration of the franchise or renewal any party to whom a franchise over the routes has been granted shall have the right to purchase the property under the terms provided for the city in section 8.

Sec. 15. The company shall make known the true state of its financial affairs, and the director of accounts shall have the right at any time to examine the books of the company to ascertain the exact condition of its affairs.

Sec. 16. Wherever the joint use of tracks with other company or the construction of straddle tracks is authorized, the same shall include the joint use of curves, sidetracks, switches, etc.

Sec. 17. The company to pay its proportion of the cost of maintaining the tracks owned by the city.

Sec. 18. The construction and operation of the road shall be subject to the general street railway ordinance now in force, except as herein modified; also to future ordinances.

Sec. 19. Tracks over the routes described to be built within six months of date or publication of ordinance, and to be operated within one year, unless prevented by legal action over which the Council has no control, or unless the board shall extend the time.

Sec. 20. Wherever the name of John B. Hoefgen appears it shall be understood to mean his legal heirs, representatives or assigns.

Sec. 21. The franchise hereby granted shall expire twenty years after date of passage of ordinance.

Sec. 22. This ordinance to take effect within ten days after legal publication and acceptance by John B. Hoefgen.

Passed March 24, 1902.

In the accompanying map, where two lines occupy the same street, either by use of the same tracks or by straddle tracks, they are shown distinct but very close together.

The situation on Fulton Street presents a somewhat perplexing proposition to the new company. The Cleveland City Railway occupies the street with a single-track line, cars operating both ways. Mr. Hoefgen's franchise authorizes a double-track straddle track line on this street, which, of course, is impossible with the present single track occupying the center of the street. The only way to overcome the difficulty would be to pull up the existing track, and the existing company would make a hard fight before it would permit this.

Mayor Johnson admits he expects the old companies will attempt to block construction work by obtaining injunctions.

Another injunction was granted Monday afternoon against Mayor Johnson, restraining him from withholding the written consents and withdrawals of property owners, and ordering him to file them with City Clerk Toland, subject to public approval. The petition alleges that a majority of consents of property owners was not obtained, and that the bundle of papers which Mayor Johnson has kept hidden, claiming that they were consents, are not consents at all. Interesting revelations are expected when the order of the court is obeyed.

A Street Railway Band

From a modest beginning in September, 1898, when it was organized with fourteen members, the Toledo Railways & Light Company Band, composed of employees of the Toledo Railways & Light Company, of Toledo, Ohio, has grown steadily, until at the present time it numbers thirty-eight pieces. The band was organized largely through the efforts of the late Thomas H. McLane, formerly general manager of the company, who first conceived the idea and who called to his assistance A. A. Atkinson, of the lighting department of the company, who was elected manager of the band. All of the men selected for the band had previous experience in bands. The original name of the band was the Toledo Traction Company's Centennial Band, but with the consolidation of the Toledo properties and the change of the company's name to the Toledo Railways & Light Company the name of the band was changed to the Toledo Railways & Light Company Band. The band practises twice each week, and fills many engagements during a season, mostly at charitable entertainments. It is one of the rules of the band never to charge for its services nor to accept engagements which might otherwise be secured by professional musicians. The company pays the members of the band for all the time they lose, either at practice or while playing, and also furnishes the instruments and necessary uniforms.

Improvements at Chattanooga

The Chattanooga & Lookout Mountain Railway has just completed its line from the center of Chattanooga to Lookout Mountain. Among the improvements introduced are a fine roadbed, handsome steel bridge and fine trestle. The new machinery for this road has just been placed in position in the fireproof power house of the Rapid Transit Company of Chattanooga. This brings under one management, and operated from one central station, all electric roads of Chattanooga but one. The inclines up Lookout Mountain are also operated by this same management.

Electrolysis Decision in Dayton

In the suit of the City of Dayton vs. The City Railroad Company, in the Court of Common Pleas of Montgomery County, Ohio, to which reference is made in the editorial columns in this issue, decision was rendered April 5 by Judge O. B. Brown. The experts for the plaintiff were: Professor Dougald C. Jackson, Dabney H. Maury, Professor B. F. Thomas, L. Clifford Anderson, J. H. Shaffer, Professor Russell Elliott, A. A. Knudson and many others. For the defendant the experts were: Albert B. Herrick, Professor George F. Seaver, Norman McD. Crawford, Thomas J. Creaghead, George M. Hoag and many others. The attorneys for the plaintiff were Messrs. Mathews & Gottschell and for the defendant McMahon & McMahon. J. A. McMahon, the senior counsel for the defense, acknowledged that the return circuit of the railway company was not all that it should be, but explained that the present condition was due to the fact that this lawsuit had been hanging over them for a number of years, and if the company had brought its system up to the desired efficiency of the ground return circuit its money would have been uselessly expended if the court had demanded the introduction of a double trolley, as this would have involved a complete change of their system. The decision, slightly in abstract, follows:

OPINION

This case is now before the court upon the law and the testimony for a final decision, in so far as this court is concerned. It involves many intricate and novel questions of law, and large moneyed interests. It raises questions which have never been raised before, and involves the application of scientific principles which have never been determined by the courts.

The trial to the court has been conducted with great skill and ability on the part of the very able counsel. The trial lasted about eight weeks, and the typewritten copy of the testimony covered several thousand pages. The oral arguments occupied one week. Of the numerous witnesses, thoroughly examined and cross-examined, were some twenty experts, being from among the leading authorities in the United States, in electrical engineering, hydraulic engineering, metallurgical and chemical engineering; also mechanical and street railway engineers and managers. There were 119 exhibits in addition to those attached to the various depositions. These exhibits include all kinds of gas and water mains, service pipes, patent joints, valve boxes, a miniature electric railway, samples of concrete and soil, besides many charts, plates, photographs, tables and documents generally. Many of the scientific tests and experiments were conducted in the court room.

Let us first review the case by giving a synopsis of the pleadings, not omitting the essential averment.

The petition sets forth the corporate capacity of plaintiff and defendant;

That the waterworks of the city were constructed in 1870, and describes the position and extent of the same;

That the defendant operates its cars over its tracks on Third and Fifth Streets, and La Belle and Richard Streets, by electricity, and has done so since 1894, the power house of said company being situated on lot 12,490 of the consecutive numbers of lots in said city; that the electricity is conducted from the power house to the motors upon the cars of said company by means of overhead wires. No metallic circuit for the return of the electricity to the power house after having been used has been furnished, but the electricity after being used escapes from the cars to the rails and from thence returns as best it may, the earth, the rails and the said water pipes and mains forming the return circuit;

That the rails of said tracks are not perfectly bonded and the returning electricity leaves the rails at sundry places, enters the earth, goes from the earth to the water pipes and leaves the pipes for the earth in returning to said power house, whereby the said pipes have been, and are being, badly damaged, at sundry points, and in many instances ruined, by the action of electricity upon the same, such action being known as electrolysis, the effect of which upon said pipes being to sometimes soften the material, so that it becomes weak, and splits, and sometimes to perforate it with holes, allowing the water to escape;

That the city has been compelled to dig up and replace sundry of said pipes;

That the extent to which the pipes of said waterworks system have been damaged by electrolysis is not accurately known, and cannot be without digging up all of the pipes, but much injury thereto has been discovered by leaks and breaks, and pipes have had to be replaced several times in the last three or four years;

That if the electrolysis continues still greater injury will result—and the liability exists that the mains and water pipes will in time of conflagration burst, which will result in great disaster to the city and its people.

That it is possible for the defendant to adopt and use devices and

systems and methods of traction that will prevent electrolysis, but impossible for the plaintiff to do anything to prevent such injury;

That the defendant has been advised of these injuries, and demand has been made that it stop the damage, but it has not attempted to remedy the evil, nor taken steps nor done anything toward securing or using a device or system of traction which will prevent its escaping and returning electricity from affecting the water pipes;

That unless prevented by this court defendant will continue to operate its road as now, using the earth and water pipes for the return circuit of its electricity, and the damage to the pipes will continue, and the waterworks system rendered valueless, to the great and irreparable damage to the city;

That the plaintiff has no adequate remedy at law, and damages will not compensate it for the injury to said water pipes, nor for the disasters and evils which accrue to it and its citizens;

The plaintiff prays that a mandatory injunction may issue commanding the defendant to adopt a new system of traction and such devices as may be necessary to prevent the electricity from damaging said water pipes of said city and its inhabitants.

The answer to the defendant contains two defenses:

The first defense. Admitting corporate capacity; the occupation of the streets; the existence and location of the water pipes; the operation of its cars by electricity; the location of its power house; the supplying of power through overhead wires and the use of the rails for the return of the current to the power house;

Denies that its rails are not perfectly bonded, averring that it has adopted, and keeps in use, the best-known systems as they are invented; and, having no knowledge,

Denies that electrolysis exists and all allegations as to damage from currents of electricity generated by it;

Denies that it can adopt, without concurrence of the city, any system that will prevent electrolysis; that it knowingly or purposely uses the pipes for the return of its electricity; or that the city has ever proposed or suggested any plan to remedy the evil.

The second defense. In answer to the prayer of the petition, pleads the purchase of the Dayton Street Railroad and the Fifth Street Railroad in May, 1893; then states the organization of the two companies, and the grants received by them; then sets forth the renewal and extension of the grant to The Dayton Street Railroad Company on February 8, 1892, which is now in force as the contract between the city of Dayton and the defendant The ordinance of February 8, 1892, is set out in full, Sec. 6 of which grants "permission to operate said road by animal, electrical or cable power";

That the franchise of The Fifth Street Railroad Company was finally extended by the city April 25, 1893, which is now in force as the contract between the city of Dayton and the defendant. The ordinance of April 25, 1893, is set out in full, Sec. 2 of which "authorizes use of trolley or storage electric or cable motive power for the purpose of propelling its cars";

That pursuant to such grants the defendant, having acquired both The Fifth Street Railroad Company and The Dayton Street Railroad Company, equipped its lines so as to operate by electricity in 1894, and has so operated its lines since;

That at the time said roads were equipped with electricity, the same was done under the supervision and control of the proper officials of the plaintiff; and with their knowledge, acquiescence and approval, and the approval of the plaintiff, described in the petition, in which the current of electricity generated at the power house and transmitted over the wires strung above the cars, supported on poles placed on either side of the street, etc.; the essential part of each system was the use of the rails to carry the current back to the power house—such system was the only one in general use in the United States and was then regarded as the only practical system for the operation of electric railways. The double trolley was then in existence in only one city and adopted for local reasons. The single trolley was much more economical, much simpler and much less dangerous to employees, and had been endorsed by the decision of the highest court of Ohio, and had the approval of scientific and practical men throughout the country; single trolley had then been in use in the city of Dayton on the White Line for seven years;

Sets forth nine grants to other companies since franchise granted defendant, and that all are using the same system, having various power houses, and all the lines cross and intersect with the defendant's and each other;

Admits its obligation to use reasonable care to prevent the escape of the electricity from the rails to the pipes and avers it has used this care and diligence;

That it proposed a method of protection to the city officials, which was declined and the city has suggested no different method;

It has no information from the petition what systems are referred to which it is to be compelled to adopt; admits knowledge of double trolley in Cincinnati, and of New York and Washington conduit systems, but avers that the adoption of either system would not obviate the danger or protect the pipes so long as the other systems of railways exist in Dayton;

That the conduit system is impracticable and the overhead double trolley would involve an outlay of a very large sum of money in reconstruction, and a great increase in operating expenses, and would cause a great increase of the danger to employees, and result in numerous additional wires and increase the difficulty of handling fires;

That there are various methods by which the city can protect itself, and other methods by which it and plaintiff, acting in concert, which defendant has been, and is, willing to do, can entirely obviate the danger;

Knows of no way by its own action to prevent the escape of electricity, except to keep its tracks in good repair and properly bonded; this it has always done and is ready always to do; that the city by locating the tracks of street railways, as well as its water pipes and connections, makes all efforts to prevent electricity escaping entirely futile;

That this court is without authority to compel defendant to make the change in the construction, for the reason that such original construction was authorized by the city, and large sums of money have been expended in reliance upon the contracts between the city and the defendant; the right to use the rails as a return circuit was granted by the city, and the city has not repudiated the contract. No action has been taken by the city in any of its departments requiring the change, and defendant would not have power even under an order of court to make such change without permission of the city.

REPLY OF THE CITY.

After admission of certain facts, denies that the single-trolley system was in successful use in this city prior to defendant operating its road, so far as affecting the property of the city was concerned;

Denies that any of the grants set forth were for single-trolley system; that the grant was only a general grant to use animal, electrical or cable power, and defendant has no authority to use the single trolley unless that power is implied in the general power granted;

That by granting the power to operate cars by electricity plaintiff did not intend, nor did it, by granting such power, authorize the defendant to use the single-trolley or any system that would interfere with or damage the property of the plaintiff or its citizens;

That the defendant has known for six years that the single-trolley system interfered with the water pipes; that the electricity escaping from its rails caused electrolysis and great damage to the plaintiff, but has continued to use the same and neglected and refused to operate its road so as to prevent further damage to the water pipes; that when defendant installed and began to use the single trolley, it knew that a portion of the electricity used would pass from rails to earth and return along the water pipes. Averments as to conference and the urging of use of double trolley. Averments as to pending suits against the other companies;

That plaintiff has demanded that such change in operation shall be made as will prevent damage to water pipes. Averments as to necessity of water pipes.

RIGHTS OF THE PARTIES TO THE USE OF THE STREETS.

The city has the general power to provide for water supply and for the construction of waterworks (Secs. 1692-31, Rev. Stat.).

It has the power to construct and extend its waterworks system; take possession of land for that purpose; and when it orders waterworks to be constructed, or purchases from any individual or corporation any waterworks already constructed, it can establish a board of three trustees, to be known as the trustees of the waterworks, who shall be elected by the people and manage the system (Secs. 2407 to 2435, Rev. Stat., inclusive).

Water companies, organized for this purpose, have also the right of supplying the inhabitants of municipal corporations with water, and have the right, with municipal consent, to lay pipes in the streets and alleys of such municipality (Sec. 3550, Rev. Stat.).

The power conferred upon a city by a legislative grant, to maintain waterworks for supplying its inhabitants, is a grant for private purposes, and the waterworks system is the private property of the city, and its citizens are alone interested in them. The outside public, or the people in the State at large, have no interest in them, as they have in the streets of a city, which are public highways (City of Detroit vs. Corey, 9 Mich., 165).

There is a distinction between the powers of a municipal corporation which are governmental in their nature and those which are exercised for the management and improvement of property. The first represents the State, and its responsibility is governed by the rules which apply to like delegation of power. The second repre-

sents the proprietary interests, and the rules which govern individuals are properly applicable in such case to a municipal corporation (Cincinnati vs. Cameron, 33 O. S., 336). This case has been distinguished in the case of Wellston vs. Morgan, decided Nov. 19, 1901, 65 O. S., 219, in regard to implied municipal liability, under Sec. 1693, Rev. Stat., which became a law long after the above case was decided, but no reference is made to the decision in so far as it is applicable to the matter under consideration.

A municipal corporation possesses a double character; the one governmental or public, the other proprietary or private (Cable Co. vs. Baltimore, 66 Fed., 140).

In the exercise of these business powers, a municipality is governed by the same rules as a private corporation or an individual (Ill. Trust & Savings Bank vs. Arkansas City, 76 Fed., 272).

Water pipes are not an additional burden to the highway (Newburyport Water Co. vs. Newburyport, 168 Mass., 553).

But the right to use the streets of a city for the laying of water pipes is a franchise and must emanate either directly or indirectly from the Legislature (State of Ohio, ex rel., vs. Cincinnati Gas Light & Coke Co., 18 O. S., 262).

If one buys a lot adjoining a street, he takes it subject to the right of the public to use the street for all the appropriate purposes of a street. But the erection of a water tank by the city in the center of the street near his lot, on which he had previously erected a home, is not one of the uses of a street which may be appropriately used under its dedication for a street, and the owner may maintain an action to recover damages done to his property in consequence thereof (City of Morrison vs. Hinkson, 87 Ill., 587).

The streets of a city are laid out primarily to accommodate public travel, and the right attaches to do whatever is necessary or proper to facilitate such travel. But the use of a street for the laying of water pipes to supply its citizens with pure water is a requisite to public health and public safety, and such use is proper and legitimate (Lewis on Eminent Domain, Secs. 126 to 138).

And should the city or any corporation authorized to use the streets for the laying of pipes obstruct the streets, such obstruction would be a nuisance (Gas Co. vs. Columbus, 50 O. S., 65; Ex parte Manhattan, 22 Wendell, 653).

One of the modes of public travel authorized by our statutes is that by street car (Sec. 2501 et seq., Rev. Stat.; Sec. 3437 et seq., Rev. Stat.).

"With rare unanimity the courts have concurred in holding that an electric street railway, constructed and operated upon the streets by means of an overhead trolley wire, supported by poles, with permission of the public authorities, for the transportation of passengers only, and conforming its tracks to the surface of the ground, is not an additional servitude upon the fee within the streets, but a legitimate use of the streets within the original general purpose of their dedication" (Cumberland Telegraph & Telephone Co. vs. Ry. Co., 93 Tenn., 503; Halsey vs. St. Ry. Co., 47 N. J. Eq., 380; Railway Co. vs. Winslow, 3 O. C. C., 425; Lockhart vs. Railway Co., 139 Penn. State, 419).

The use of the streets for waterworks purposes is obtained by legislative authority. The right of an electric railway to use the streets is from like authority. Each of these uses are beneficial to the public, and each are entitled to enjoy their respective rights without interfering with the rights of the other, and it is clear that no conflict can occur between the two if each shall remain within its own sphere and exercise its powers with due care and prudence. It is not necessary, in arriving at a proper decision in this case, to determine which should give way to the other. Both are legal and both are important, and of almost equal necessity to the inhabitants of the city.

Under the testimony and law in this case I do not believe it is necessary to determine which is primary and which is secondary. Each should exercise its functions for the general good, exercising due care, and not interfering with the proper rights and duties of the other.

With these considerations in view, and giving to the function of each due weight, as stated, a decision satisfactory to the court may be arrived at in this case.

FRANCHISE OR CONTRACT.

The franchise of a street railroad company is that which is commonly known as the ordinance under which it operates within a municipality. But it is conceded by all lawyers that the franchise emanates from the State and not from the city. The Legislature confers the authority upon the municipality, and the municipality, through its proper board or boards, passes an ordinance in accordance with the power so delegated, and this ordinance, when accepted by the street railway company, constitutes a contract or agreement between the parties, which cannot be altered by either party (State, ex rel., Silsbee vs. Boyce, 43 O. S., 46; The Cincinnati St. Ry. vs. Smith, 29 O. S., 291; Belleville vs. Railway Co., 152 Ill., 171; Louisville Gas Co. vs. Citizens Gas Co., 115 U. S., 650; Greenwood vs. Freight Co., 105 U. S., 13).

The ordinances set out in the answer, and which have been introduced in evidence, the one to The Dayton Street Railroad Company, passed Feb. 8, 1892, and the one to The Fifth Street Railroad Company, passed April 25, 1893, constitute a contract between the city of Dayton and The City Railway Company, it having acquired by purchase all the assets of both of said companies.

Sec. 6 of the grant to The Dayton Street Railroad Company provides for "permission to operate said railroad by animal, electrical or cable power."

Sec. 2 of the grant to The Fifth Street Railroad Company authorizes the "use of trolley or storage electricity or cable motive power for the purpose of propelling its cars." And the testimony shows that pursuant to the above ordinances The City Railway Company in 1894 equipped its lines so as to operate by electricity, the Third Street line Oct. 5, 1894, and the Fifth Street line Dec. 3, 1894.

There are no other provisions in the ordinances or contracts as to the manner of this electrical equipment. The grants were for fifty years, and provide that in each case electrical power is used with the trolley system, and poles shall be placed not nearer than 100 ft. apart, and located and arranged as the city engineer may prescribe.

It is maintained on the part of the plaintiff that the grant, as the terms of the contract itself did not provide for the construction and operation of a single-trolley road, but merely that the road might be operated by electricity, could not be construed so as to authorize the defendant to operate a single-trolley road, and that the defendant could have adopted either the single or double trolley system.

In construing this grant, it must be admitted that whatever was granted was given at its date. The grant took effect on its acceptance. It was then either a grant for a single-trolley or for a double-trolley, or a grant for both. If it was a grant for a double-trolley it did not subsequently become a grant for a single-trolley, and vice versa; and if a grant for both was given, and the option to the defendant, the exercise of the option fixed the rights of the parties irrevocably.

At the time of the grant there was but one double-trolley road in the United States. There were numerous single-trolley roads, including one in Dayton, in successful operation. At that time the Supreme Court of Ohio, in the case of The Cincinnati & Suburban Telegraph Company vs. The Cincinnati Inclined Plane Railway Company, 48 O. S., 422, decided June 2, 1891, said:

> As compared with the double-trolley method, it (the single-trolley) is deemed more simple, less liable to disarrangement, much cheaper, and not liable to accident which would blockade the cars. It has proved successful, and its general adoption, with full knowledge of the double-trolley method, furnishes strong proof that it is the most approved system.

Whatever might have been the construction of the grant, if the question had been raised prior to the commencement of the work, and before the parties to it had indicated their intention by their acts, there is little room for doubt now. Under the supervision of the city authorities the defendant constructed a single-trolley street railroad. The poles were located by the engineer, and it was known to all the city authorities that the system under which they were constructing and were to operate the street railroad was the single-trolley system.

It is a well-settled rule of construction, in regard to contracts which are capable of two constructions, that where the parties themselves have by their actions interpreted the contract and acted upon it, and large sums of money have been expended upon the faith of this construction of the contract, then it becomes as binding upon the parties as if it had been written in express words (Chicago vs. Sheldon, 9 Wallace, 50; Dist. of Columbia vs. Gallaher, 124 U. S., 505; Warner vs. Railroad, 39 O. S., 70; Mosier vs. Parry, 60 O. S., 388; Railroad Co. vs. Williams, 53 O. S., 268; Railroad vs. Cincinnati, 16 Law Bull., 367, affirmed in Supreme Court, 18 Law Bull.; O'dea vs. Winona, 41 Minn., 424; Gas Light Co. vs. St. Louis, 46 Mo., 121; The Des Moines St. Ry. Co. vs. St. Ry. Co., 74 Iowa, 585).

In the case of The Des Moines Street Railway Company vs. The Des Moines Broad Gage Company, 74 Iowa, 585, the ordinance had failed to prescribe the gage of the plaintiff's road, and it had adopted a 3½-ft. gage, under which it operated for about fifteen years, when the City Council passed a resolution declaring that all tracks of street railroads occupying the streets of the city should be laid of the standard gage, 4 ft. 8½ ins. It was held under this same principle that the city did not have the power to require the plaintiff to change its tracks or extend it as a standard gage street railroad.

It was shown in the testimony in this case that since the construction of The City Railway lines grants have been made to some

six or eight other roads, and all have been constructed with the single-trolley system.

After carefully considering the law and the facts in regard to this matter, I am of the opinion that the contract between the parties in this case was for the construction, operation and maintenance of a single-trolley electric street railroad.

LEGAL DUTY OF DEFENDANT OPERATING UNDER ITS FRANCHISE RIGHTS

The principle of law relied upon by the plaintiff to entitle it to the relief prayed for is that stated in the old Latin maxim, "Sic utere tuo ut alienum non lædas," a literal translation of which, according to Broom's Legal Maxims, page 248, is: "Enjoy your own property in such a manner as not to injure that of another person." In commenting upon this maxim, after reviewing a number of cases, Mr. Broom says: "From the above and similar cases we may infer that much caution is needed in applying the maxim now under our notice in determining how far it may lead a given state of facts restricting the mode in which property may be enjoyed or used."

The plaintiff's rely particularly upon the case of Fletcher vs. Rylands, 1st Exchequer (L. R.), 265, and 3d English and Irish Appeal Cases (L. R., 1868), 330. The defendants constructed a reservoir on their own land, separated from the plaintiff's coal mines by intervening land. The mines under the site of the reservoir and under part of the intervening land had at some remote period been worked, and by lawful mining in his own territory and in the intervening land had opened an underground communication between his own mines and the old workings under the reservoir. Neither the defendants nor their agents knew of this and were not guilty of any negligence in the construction of the reservoir, or by not knowing these facts. When the reservoir was filled, the water burst down these old shafts, and flowed by the underground communication into the plaintiff's mines, damaging them seriously, and the court held that the plaintiff was answerable for all the damage which was the natural consequence of its escape, on the principle that one who for his own purposes bring upon his land and collects and keeps there anything likely to do mischief if it escapes is prima facie answerable. This case was taken on an error to the House of Lords, as above cited, and the judgment of the Exchequer Chamber, as above cited, was affirmed, the syllabus being:

> Where the owner of land, without wilfulness or negligence, uses his land in the ordinary manner of its use, and an injury should thereby be occasioned to his neighbor, he will not be liable in damages. But if he brings upon his land anything which would not naturally come upon it, and which is in itself dangerous, and may become mischievous if not kept under proper control, though in so doing he may act without personal and wilful negligence, he will be liable in damages for any mischief thereby occasioned.

This does not apply, even in England, where the water doing the damage had been brought upon the premises by artificial process in accordance with the provisions of a legislative grant, the defendant being liable only for actual negligence (Blyth vs. Birmingham Water Works Company, 11 Exch., 781).

In the case of The National Telephone Company vs. Baker, 2d Cham. Div. (L. R., 1893), page 186, in commenting upon the case of Fletcher vs. Rylands, on page 200, Chancellor Kekewich cites the case of The Cumberland Telephone & Telegraph Company vs. The United Electric Railway (47 Fed. Rep., 273), stating that while the judgment in that case is not binding upon him, it has commanded his earnest attention and respect, and but for one circumstance would allow himself to be guided by the arguments in that decision. That one circumstance is the want of full adoption of the principle of Fletcher vs. Rylands, and said:

> American law apparently holds the owner of land used for non-natural or extraordinary purposes responsible for the consequences of such damage to his neighbor only when they result from the owner's negligence; and if he can satisfy the court that he has not been guilty of negligence, the resulting damage to his neighbor is not actionable. It seems to me that if the principle of Fletcher vs. Rylands had been fully adopted in America the conclusion of the court in the case just cited must have been different. I believe that in Scotland, too, the principle of Fletcher vs. Rylands has not been accepted, and is not regarded as consistent with justice between man and man.

In 29 O. S., page 368, Railroad Co. vs. Bingham, which was a case for the recovery of damages for personal injuries, where the person receiving the injury was not at the place of danger by lawful right, the court, in reviewing a number of cases to show that there was no liability, says:

> In such cases the maxim "Sic utere tuo ut alienum non lædas" is in no sense infringed. In its just and legal sense it means "So use your own property as not to injure the rights of another." Where no right has been invaded, although one may have injured another, no liability has been incurred. Any other rule would be manifestly wrong.

In Defiance Water Co. vs. Olinger, 54 O. S., 532, which was a suit to recover damages for personal injuries received by reason of the water company negligently storing water in a standpipe on its own premises, Judge Bradbury, after citing the case of Fletcher vs. Rylands, and the comments of the court in that case, on page 540 says:

> This doctrine would seem to be in exact accord with justice and sound reason, but in the case before us we are not required to apply it to its full extent, because the defendant in error, in her amended petition, expressly avers negligence in the construction of the standpipe, as well as a knowledge that it had afterward cracked and become weakened, a negligent failure to make repairs, and that the accident which caused her injury was the direct result of such negligence.

In Crawford vs. Rambo, 44 O. S., 279, the court held that the above maxim applied in that case, where the owner of land situated on a river had constructed embankments for the purpose of protecting the lands, and where the lands of others situated upon the same stream were materially injured, it was held that the party constructing the embankments must exercise ordinary care, intelligence and foresight, or he will become liable.

In Bradford Glycerine Co. vs. The St. Mary's Woolen Mfg. Co., 60 O. S., 560, which was a case where the plaintiff in error had stored on his own premises nitro-glycerine, recognized as highly explosive and dangerous, it was held to be liable in damages for injuries caused to surrounding property by its exploding, although the defendant neither violated any provisions of law regulating its storage nor was chargeable with negligence contributing to the explosion. Judge Bradbury, in deciding this case, reviews the case of Fletcher vs. Rylands. He says:

> It seems to recognize a distinction in this respect between an ordinary and an extraordinary use of the premises by their owner, and had that learned tribunal then had before it a case where damages were sought on account of injuries resulting from the explosion of a steam boiler in a manufacturing establishment, it might have denied the liability in the absence of the proof of negligence, on the ground that the owner was using his premises in an ordinary manner.

The court held the Glycerine Company liable on the ground that the storing of glycerine is an extraordinary and unusual use of property. Judge Shauck dissented from the decision.

In the case of The National Telephone Co. vs. Baker, supra, the chancellor states one of the defenses of the railroad company is that, if in the proper exercise of statutory power they injure the plaintiffs, they are free from blame, and after reviewing a number of cases cited, on page 203 says: "The defendants are expressly authorized to use electrical power, and the Legislature must be taken to have contemplated it, and to have condoned by anticipation any mischief arising from the reasonable use of such power." And on page 204, referring to this defense, the chancellor says: "To this plea of statutory power the plaintiffs have a rejoinder. They say that such power cannot avail the defendants unless they have acted reasonably in the exercise thereof, and have done their best to avoid injury to their neighbors." He further says that this argument is sound in law.

In the case of The Hudson River Telephone Co. vs. The Watervliet Turnpike Co., 135 N. Y., 393, the court reviews the same subject, and holds that where a corporation is exercising a delegated authority for public benefit, and damage has been sustained as the result of proper exercise of this power or privilege conferred by law, there can be no recovery.

These decisions lead to the inevitable conclusion that where there are contractual relations between the parties authorized by legislative grant, and there has been a proper exercise of such grant, by the use of due care, no cause of action will lie against the party so properly exercising such franchise or right under the contract or statute.

POWER OF THE COURT TO COMPEL A CHANGE OF SYSTEM.

Counsel for the plaintiff contend that the court should, by mandatory injunction, compel the defendant to adopt the double-trolley system, the conduit system, or some system which provides for a complete insulated return of the electricity to its source of power, because:

1. The water mains of the defendant have been, and are being, destroyed by the escaping return current;
2. That there is no possible way for the plaintiff to protect its property from this return current;
3. No other method is known, in the present state of the science, by which the return current may be wholly kept from escaping and doing damage to the water pipes.

Now, let us examine the law in order to ascertain, if the above facts are true, whether this court has the power to make such an order.

I have already determined, as stated heretofore, that the franchise, or contract, between the parties was for the construction, operation and maintenance of a single overhead trolley street railroad. This being so, the contract rights being inviolable, how can a court of equity make the order demanded? It may do so in order to enforce an implied obligation in the original contract; that is, if there

is an implied obligation in the contract itself for the defendant to take care of its entire current, so that it does not use the city property in its return to the source of power; or if the police powers, duly authorized by law, have been legally exercised, then this court may, if the facts warrant, make an order as demanded.

Now, if the contract between the parties was for the operation of the single overhead trolley, the reasonable use of the property of the city was a necessary implication in the original contract, and if this use had been exercised with ordinary care there could be no authority in the court to cause a change of the system; and even if the exercise of the franchise had been unreasonable and continuing damage had been done, as admitted in this proposition, no change could be ordered, unless the police powers of the city had first been invoked by proper legislative action.

It can be stated as a clear, undoubted legal proposition, that it is the province of the law-making power to determine when the emergency exists for calling into exercise the police power. What are the subjects of its exercise is clearly a judicial question (Lakeview vs. Rosehill Com. Co., 70 Ill., 191).

The board of city affairs of the city of Dayton has exclusive care and control over the streets of the city (Sec. 1707-d-4, Rev. Stat.).

The City Council, which, as the evidence shows, passed a resolution authorizing the city solicitor to bring this suit, has no power over the management of the streets in this city, and, while I am of the opinion that the city solicitor had power, under Sec. 1777, Rev. Stat., to bring this action in the name of the city, because in his opinion he was warranted to proceed under that section, as a contract of the city was being violated or evaded, there is nothing to show that he was acting for the board of city affairs, and that if an order were made in this case as demanded under this proposition, the board of city affairs, possibly, would not be bound to submit to such an order, or if the court should order the double overhead trolley system, might, within a short time, order the conduit system, or some other system which might subsequently be discovered to be feasible.

THE LITIGATION OF THE TELEPHONE COMPANIES vs. THE SINGLE-TROLLEY COMPANIES

It becomes interesting and instructive, at this stage, to review, briefly, a line of cases growing out of litigation between the telephone companies and the single-trolley street railroads, which are the only cases of record which have any similarity to the one under consideration.

The telephone companies brought suits for injunctions in numerous States and in the United States courts and in England to compel the single-trolley street railroads to adopt the double-trolley system, and prevent induction and conduction of their telephone system, and in some instances brought suits for damages, to recover money expended in reconstructing their plants to prevent the annoyance and damage caused by the single-trolley system. These cases were all determined in various ways, but the principles discussed have run through all. The entire trouble was finally done away with, and the litigation stopped by the invention of a system called the McClure device, by which the return current of the telephone companies was cared for by independent wires.

Among the leading cases upon this subject was The Cumberland Telephone & Telegraph Co. vs. The United Electric Railway Co., reported in 42 Fed. Reporter, 273, decided in the Circuit Court, Middle District of Tennessee. The decision is by Judge H. B. Brown, who, shortly after this case was decided, became an associate justice of the Supreme Court of the United States. Judge Brown says:

> In solving this question we are compelled to bear in mind the fact that the science of electricity is still in its experimental stage; that a device which today may be the best, cheapest and most practicable may in another year he superseded by something incomparably better fitted for that purpose.

After reviewing a number of questions involved, and cases cited, Judge Brown says:

> We take it to be well settled, so far as persons operating under legislative grants are concerned, that something more than mere incidental damages must he proved—something, in fact, in the nature of an abuse of a franchise—to entitle the party injured to an injunction. * * * The substance of all the cases we have met with in our examination of this question is that where a person is making lawful use of his own property or of a public franchise in such a manner as to occasion injury to another, the question of his liability will depend upon the fact whether he has made use of the means which, in the progress of science and improvement, have been shown by experience to be the best; but he is not bound to experiment with recent inventions not generally known or to adopt expensive devices when it lies in the power of the person injured to make use of an effective and inexpensive method of prevention. If in the case under consideration it were shown that the double trolley would obviate the injury to the plaintiff without exposing defendants or the public to any great inconvenience or large expense, we think it would be their duty to make use of it, and should have no doubt of our power to aid the complainant hy an injunction; but as the proof shows that a more effectual and less objectionable and expensive remedy is open to the complainant, we think the obligation is upon the telephone company to adopt it, and that the defendants are not bound to indemnify it; in other words, that the damage incidentally done to the complainant is not such as is justly chargeable to the defendants.

The injunction was denied on the following grounds:

1. That the defendants were making lawful use of the franchise conferred upon them by the State, in the manner contemplated by the statute, and that such act cannot be construed as a nuisance in itself.
2. That in the exercise of such franchise no negligence has been shown, and no wanton or unnecessary disregard of the rights of the complainant.
3. That the damages occasioned to the complainant are not the direct consequences of the construction of the defendants' roads, but are incidental damages resulting from their operation, and are not recoverable.

In our own State the Supreme Court determined this question, in the case entitled The City & Suburban Telegraph Association vs. The Cincinnati Inclined Plane Railway Co., 48 O. S., page 390, decided June 2, 1891. This case had as many eminent counsel engaged in it, and is as fully discussed and determined by the court, as any case upon the subject, and the finding is in favor of the railway company, reversing the Superior Court of Cincinnati. The court says, on page 434:

> It is contended, however, in behalf of the defendant in error, that, conceding the railway company and the telegraph association to be on an equal footing on the streets and highways in the enjoyment of their respective franchises, the company is bound to conform to the rule "Sic utere tuo ut alienum non lædas." In the view which we take of the relation to each other of the parties to the action, we deem it unnecessary to inquire whether there has been a want of conformity, and to what extent, if any, on the part of the railway company to the requirements of the legal maxim. Nor do we think it necessary to inquire how far the company, making a lawful and careful use of its own property or of the franchise granted to it by the municipal authorities, may be held liable for damages incidentally caused to the association.

A similar case in the Court of Appeals of New York, The Hudson River Telephone Company vs. The Watervliet Turnpike & Railway Company, 135 N. Y., 393, was also decided in favor of the single-trolley railroad. On page 409 the court says:

> We are not prepared to hold that a person even in the prosecution of a lawful trade or business upon his own land can gather there by artificial means a natural element like electricity and discharge it in such a volume that, owing to the conductive properties of the earth, it will he conveyed upon the grounds of his neighbor with such force and to such an extent as to break up his business, or impair the value of his property, and not be held liable for the resulting injury. * * * If either collects for pleasure or profit the subtle and imperceptible fluid, there would seem to be no great hardship in imposing upon it, or making the same duty which is exacted of the owner of accumulated water-power, that of providing an artificial conduit for the artificial product, if necessary to prevent injury to others; but the record before us does not require a determination of the question in this form. * * * We are spared the task of discrimination in this case by reason of the legal attitude which the plaintiff has assumed in its occupation of the streets. It is accorded to the public, by the manner in which it has elected to use its franchise, the unrestricted right of passage, and it cannot question the form in which such rights shall he enjoyed, so long as it is of lawful origin and is utilized with proper care and skill.

The analogy used in this case, of the escape of water to the injury of others, might apply where there are no contractual relations existing between the parties.

The last case on this subject which I wish to consider is the very instructive case of The National Telephone Company vs. Baker, supra. This is from the Supreme Court of Judicature of England, and the decision is by Mr. Justice Kekewich. I have heretofore mentioned this case in connection with the principle decided in Fletcher vs. Rylands. The court held against the telephone company, both on the question of injunction and damages. He says:

> It cannot be that in the application of the law which I am now considering the court is bound to hold a railway or other company liable for the consequences of acts done under statutory powers because it has not adopted the last inventions of ever-changing, ever-advancing scientific discovery.

He discusses the question of the ever-changing science of electricity, and maintains that it would not be good common sense to say that an electric railway which was not liable last year or last month because until then it had operated its line according to the best understanding of the science, not because those rules had proved wrong in practice, but because the inventor had made improvements which in a short time may be shown to be only a step in the progress of the science, and this would be the case if he held with the telephone company that the single-trolley system, so largely approved where it has been largely tried, should be deemed at fault because another system is in use and apparently successfully used at Buda-Pest or elsewhere. He states, in conclusion, a very important matter which, I believe, is applicable in this case:

> I do not wish to prejudice the question whether a charge of negligence in the exercise of statutory powers can be supported by cogent evidence, that the company exercising those powers has failed to adopt alterations or precautions which experience has shown to be of large, undisputable and permanent value. That question may easily arise in many of the disputes which are likely enough from time to time to occur between public companies and those whom their operations injuriously affect.

THE FACTS.

The mere passage of a current of electricity along a water pipe in the ground does not cause injury. There must be a departure of the current from the pipe through a proper electrolyte. It was agreed by the experts that 1 amp. of electricity flowing continuously from cast iron under the proper conditions to cause electrolysis would remove about 20 lbs. of iron in one year and of lead pipe about 75 lbs. It is necessary that the soil surrounding the pipe, in order to be a proper electrolyte, shall contain a solution of some metallic salt, that is, a compound formed by the union of a metal with an acid, as common salt, which is a union of the metal sodium with the acid chlorine, and is found in all soil. The broad statement that all electric current flowing from a pipe in the soil carry iron is incorrect. It depends upon the character of the soil and the chemical action or reaction taking place. It might result in the formation of compounds of iron, or it might result in the decomposition of the electrolyte.

The soil of the city of Dayton generally, as shown by the evidence, consists of loam, clay and gravel, the gravel being from 65 per cent to 90 per cent, the loam and clay being of about equal proportions, the loam being of a higher percentage west of the river and the clay of a higher percentage east of the river. It contains a considerable amount of alkaline salts. The soil is conducive to moisture on account of its porosity, thus making it easily subject to electrolytic action, but it is not of a nature to cause corrosion similar to that found upon pipes affected by electrolysis. It is claimed by one of the experts, as shown in an exhibit, that every pitted or thin pipe which is attributed to electrolysis can be duplicated with pipes that have never received nor been in a locality where electric currents could touch their surfaces; but this was not shown in this case, and the soil of Dayton, as admitted by the experts, was not of such a nature.

It was shown during the trial that cast-iron water pipes which had been buried in the soil of Dayton for more than thirty years, and being recently tested, showed that the coating retained its glossy appearance, and upon removing the coating with a file the metal possessed its metallic luster, and there were no signs of deterioration whatever.

The electrolysis of water pipes appears to have been first recognized about the year 1893. A year or so before that certain injuries were recognized, but it was not agreed that this was caused by the electric current until the latter date, and the effect and the conditions were not generally known until several years later than 1893.

The operation of the first single-trolley road in cities was one at Richmond, Va., installed in the early part of 1888. The White Line in Dayton, now operated by The People's Railway Company, commenced operating in August, 1888, but the present system of operation did not become general until the early nineties.

The first discovery of electrolysis in Dayton was upon a lead service pipe taken out on Washington Street where the White Line was in operation in the summer of 1893, and in September of 1893 the superintendent of the Dayton waterworks, who is still such superintendent, was sent as the representative of the Dayton Waterworks Board to the American Waterworks Convention at Milwaukee, where the question of electrolysis of water pipes was first publicly discussed.

As to the amount of current sufficient to cause electrolysis the experts in this case do not agree. It is contended by the experts of the railway company that where the difference of potential between the surface of an iron pipe covered with oxide of iron and the adjacent electrolyte was less than one-tenth of a volt, and the current density less than 4 amps. per square foot that the pipe would not be acted upon by the continuous flow of the current, and no electrolytic damage would be caused. The experts on behalf of the plaintiff contend that this is entirely in conflict with the laws of electrolytic action; that this statement involves the idea that unless the current density is as great as 4 amps. per square foot of surface that no electrolytic damage will result, which is equivalent to saying that a current of 3.9 amps. per square foot might be flowing away from the pipe into an electrolyte and yet no electrolytic damage result; that one of the laws of electrolytic action is that the quantity of material that is eaten away through electrolytic action from the plate which the current leaves and passes into the electrolytic medium is directly proportional to that current strength, without any reference to the question whether that actual strength is large or small, so long as it is within the limits of producing electrolytic action, and that it is well established that any current, however small, that passes from a material subject to electrolytic action into an electrolyte will produce electrolytic action of that material, even though it be of a current density of .001 of an ampere per square foot. They further contend that from the observation of the currents on the water pipes in Dayton that if the current leaves those pipes in anything like equal distribution of current density from the iron that there are no indications of the existence of a current density of anything like 4 amps. per square foot, although it is admitted on both sides that there has been considerable electrolytic damage of water pipes in Dayton. The latter experts admit, however, that it may be possible under favorable conditions that there may be a concentration of current at an individual point within a small area, say one-fourth of an inch square, which would give a current density equal to 4 amps. per square foot; but while that is conceivable, it is impossible to make a direct test of the conditions existing, because they cannot get at the pipes in the soil itself and determine just exactly how much current strength in amperes is flowing from a given small area of that pipe.

In this connection Exhibit 33, which is a section of 6-in. water main taken from the street near the west end of the Fifth Street Bridge during the trial of this case, it having burst during a fire when the pressure on the pipes was increased from 60 lbs. to 100 lbs. per square inch, and was brought into court the following morning and examined by the experts for the first time in court. This shows that the pipe had been badly eaten away throughout its entire length by electrolysis, and indicated to the experts that the current was pretty uniformly distributed over the surface.

One of the experts, speaking of this theory, says that there must have been a total current of 20 amps. flowing continuously from this pipe to cause the damage, but that the experiment conducted in that vicinity showed that the amount of current which flowed from Exhibit 33 was not so great as that, and that if a current of 4 amps. per square foot of surface was flowing continuously from the surface of Exhibit 33 while in the soil, and this current was uniformly distributed over the surface, that 1 ft. in length of the pipe would be destroyed by the electrolytic action in about ten weeks, and that there were no evidences of any film of oxide which would prevent further electrolytic action, and that even a film of oxide when moist, as the conditions of the soil of Dayton are admitted to be, is not an insulator, but a fairly good conductor.

The testimony shows that the greatest damage has been done, and is being done, within a few squares of the power house on Fifth Street, and much damage has been done to the lead service pipes, and therefore it must also be carried on upon the mains as far east as Main Street on both lines and as far west as Williams Street. The testimony shows conclusively that the lead service pipe in front of 134 West Fifth Street, just east of Wilkinson Street, gave way first about three and a half years after the adoption of electricity by the Fifth Street line, and the second time about three and a half years later. Very many lead service pipes have been destroyed both on Third Street and Fifth Street within the positive district, showing that there have been, and there are, also, evidences of damage to the mains in the same district. It might be stated in this connection that the lead service pipes are the property of the citizens and not of the city.

The testimony shows that the only bursting of a main on the lines of the City Railway is the one that occurred during the trial, Exhibit 33. There was testimony showing that there had been the bursting of mains twice before this, both on the People's line, one occurring in the early part of 1899 in front of the People's Railway power house on Washington Street and the other on May 20, 1899, at the corner of Washington and Longworth Streets. The actual expense of the repair of the main on Fifth Street, Exhibit 33, was not given, but the cost of the repair in front of the People's power house was given as $25.29, or $4.50 per foot, including pipe and everything, and of that at the corner of Longworth and Washington Streets at $6,987 per foot.

The entire amount of money invested in the city waterworks system is about $1,619,197.25. This consists of the entire pumping station and about 121 miles of mains. The value of the mains and the laying thereof paralleling the City Railway lines is estimated by me, under the evidence, at about $71,000. The total cost of the pipe and the laying of the mains in the danger district, as heretofore approximated, is about $14,000. In order to relay the water mains in this locality the expense, without the repaving, would amount to about 65 cents per foot for 4 in., 80 cents for 6 in., $1 for 8 in. and $1.25 for 10 in. The cost of relaying the paving would cost about $1.75 per lineal foot.

The amount of current upon the pipes traced to the City Railway system has been variously estimated by the different experts at from 3 amps. to 48 amps., according to the point where tested and the location and movement of cars on the route. One of the experts of the defendant estimated from observations made by him and others that there was from 20 per cent to 50 per cent of the returning current of the City Railway flowing upon the pipes at some points.

It was claimed by the defendant that the cause of the large amount of current upon the water piping system was on account of the numerous gate boxes throughout the city being in metallic connection or within a short distance of the tracks, causing a di-

version of the current to the water mains, and that by reason of this no system could be adopted until they had been removed by the city.

These gate boxes are located at various points throughout the entire city over the valves on the water mains for the purpose of inserting a key to operate the valve. When the valve is placed on the water main earth is filled in around the valve as high as the bonnet above the flange. After the earth has been thoroughly tamped the box is set down over the valve, resting on the earth. As many of the lugs on the side of the box are knocked off as are necessary to permit the top section of the box to rest level with the surface of the street.

An investigation was made of fifty gate boxes, and of these fifty only two were found to be in mechanical contact with the pipe or rail and only one in electrical contact. The total amount of current on the gate boxes after this measurement was found to be .5347 of an ampere down the boxes and .1844 of an ampere up the boxes.

These gate boxes were all removed or replaced with vitrified tile. After these were removed tests were made by the experts, and it was found that there was practically no change in the current upon the pipes along the City Railway lines. There were no tests made by the experts of the defendant in this regard.

One of the experts of the defendant attempted to show that the method of determining the current flow upon the gate boxes, as conducted by the city experts, was faulty, and in court made a test upon the gate box which had been placed in position by the plaintiff's experts, but the experts of the plaintiff claimed that the tests of the opposing expert were not fair and were not in accordance with what had actually been done by them, and thereupon changed the wires and the battery and the millivoltmeter and performed the experiment of measuring the current, which resulted in showing to the court that if that method was used in ascertaining the current upon the different gate boxes throughout the city that it was the correct method.

THE DOUBLE-TROLLEY SYSTEM.

A complete remedy for damage by electrolysis is the double-trolley system if perfectly maintained. The testimony shows that there is some electrolytic action upon the pipes in Cincinnati through the escape of the current of the double trolley by reason of defective insulation.

There are in the United States between 1200 and 1400 electric trolley roads. Of these the only double overhead trolley road in a city is the one operated in Cincinnati. A double-trolley road is operated in the District of Columbia outside of the city of Washington. The conduit system is used in the city of Washington and in the city of New York. All others are operated by the single-trolley system. The laws and ordinances require the double-trolley system in the District of Columbia and the conduit system in the city of Washington and in New York City.

The objections to the double overhead trolley system are:

First. The expense of establishing it is greater.

Second. It is more unsightly, requiring more and heavier poles.

Third. It is more dangerous to the employees in the operation and maintenance of the road.

Fourth. In case of fire along the route it is more dangerous to handle the wires.

Fifth. The cost of maintenance is more expensive.

Sixth. At curves or intersections of lines or changing on to cross lines it is much more difficult to arrange the overhead system on account of the dead ends and the pulling down of the trolley after the car has received the momentum to cross over the dead ends, involving great danger to the controllers and motors.

Seventh. Because of more frequent breaks of the trolley wires on account of the extra pressure required of the trolley poles and because of the extra wearing of the trolley wires.

Eighth. Because of the greater loss of energy in the wire return as compared with the existing rail return.

It has been discovered, * * * that electrolytic action takes place on the positive side of each pipe joint throughout the entire system over which the current flows and at points where the current leaves the pipes to flow through the earth to some other metallic conductor, such as gas pipes. An increase of the current will, of course, aggravate this injury. The pipes as they come from the foundry are coated, both inside and out, with a tar or pitch coating which is of a higher resistance than the pipe itself, and in making the joints of the pipe as they are laid in the ground the spigot end of the pipe is thrust into the bell end as far as possible. Hemp is then driven into the space between the spigot end of the pipe and the bell end of the adjoining pipe, and molten lead is then poured into the remaining space and rammed home, making generally a water-tight joint. Now, the current in passing from one length of pipe into the next, if it passed through this joint, would have to leave the metal of one pipe, pass through this coating, from that into the lead, through the lead, from the lead into the tar coating on the next pipe and then into the metal. The resistance of such a joint has been tested and found to be of much higher resistance than the pipe itself, causing a portion of the current, in obedience to the law of divided currents, to shunt around the joint, thereby causing damage at the positive side of the joint.

The defendant claimed that this damage could be avoided by bonding such joints with copper, amalgam or iron bonds of sufficient conductivity to carry the current around or through the joint. To install such a system, the entire piping system of the waterworks would have to be unearthed and some 52,000 joints so bonded.

They also claim that the flow of the current could be intercepted and the conductivity of the piping system entirely broken up by the introduction of insulating joints at the proper points along the piping system, such as that known as the Dresser joint. This joint has been used extensively by gas companies to prevent the escape of gas, but has not been used on water pipes for the purpose advocated to any large extent. It has been tested and found to be of a very high resistance, but the effect of it, if introduced into the piping system, would be to cause the current to shunt around the joint, causing injury at the point where the current left the pipe. The rubber gasket which is a part of the Dresser joint would also deteriorate very rapidly and lose its insulating power.

The purpose and use of bonds for pipe joints and of the insulating point were illustrated in the court room by Exhibit 100, introduced by the defendant. This was supposed to represent a miniature street railway and street, with water pipes underlying the same, one pipe joint being bonded and on the other an insulating joint. It consisted of a box 52 ins. x 26 ins. x 7 ins. This box was filled with screened earth taken from an excavation at the corner of Fourth and Jefferson Streets, in this city. The rails were represented by two strips of iron about 2 ins. in depth, extending the entire length of the box. The rails were broken in the center of the box and were connected by four small incandescent lamps. The purpose of these lamps was to make the rails electrically longer, instead of having the box longer. Current was supplied by means of a battery and sent over the rails, and by means of two millivoltmeters the current flow on the pipes determined.

The purpose of this test was to compare the current that would flow on the pipe with the insulating joint and the pipe without. A service pipe covered with ordinary garden hose was also buried in the box. The current passing over the pipe with the insulated joint and the insulated service pipe was an inappreciable quantity, while the current on the other pipes was readable on the meters.

The experts for the plaintiff took exceptions to this test, for the reason that while the lengths of the rails were increased by the incandescent lamps the piping system remained the same length, and the increase of the length of the railroad system would have a tendency to increase the difference of potential between the two parts of the railroad track. That would have a tendency to increase the amount of current passing from the rails into the pipe, but it would not increase the resistance of the pipe.

LOCAL CONDITIONS.

The geographical outlay of the street railway lines in the city of Dayton has its own peculiarities which require the adoption of special remedies. There are many difficulties to overcome in the return circuit with which street railway companies of other cities do not have to contend. The return circuit is broken up by the presence of various rivers and the canal, with stationary and hoist bridges over them; also by steam railroad tracks, which cross and recross every line in the city, and by the intersecting street railroads, which have a tendency to intercept the flow of the current.

The bridges being of flexible structure, vibration results, making it extremely difficult to maintain the bonding; and it is also very often the case that the bridge structure itself is so light that the standard rail cannot be used, which reduces the cross section of the rail and consequently lessens the conductivity of that path. At the hoist bridges the rails cannot be connected at all.

At the street railroad crossings it is difficult to maintain the bonding because of the pounding of the heavy locomotives and at the street railway intersections because of the vibration and jar at the points where the tracks cross. The difficulty at the latter points is increased by the traffic of the heavy interurban cars.

CONDITION OF THE CITY RAILWAY COMPANY'S LINE.

It has been testified to by all the experts in the case that the City Railway system has been operated in a very inefficient and negligent manner and far below the present standard of the art. The bonding is very inadequate, and the most that the experts for the defendant would say for it was that in some places it is only..... and, taking the City Railway lines as a whole, it is very poor. This condition is shown very clearly by Exhibit 101, a chart showing

the condition of bonds, introduced by the defendant. An examination of this will raise a doubt as to there being any good bonds on most of the system. The effect of this bad bonding is to raise the resistance of the rail path and divert the current to the pipes. Sufficient conductors for the current have not been provided at either the railroad crossing or the bridges.

The system is also very deficient in the matter of return feeders. The testimony shows that the return feeders are 4200 ft. of 4-O copper wires attached to the rails at the ends of the Third Street and Fifth Street river bridges, the other terminal of the wires being connected to the negative bus-bar of the dynamo. The purpose of the return feeder, as heretofore described, is to conduct the current from the tracks back to the generator, after having been used in the operation of the cars.

Experts and practical street railway men who have testified in this case concur in the opinion that such a system of return feeders is not sufficient for the economic and safe operation of the city railway system.

The only other return method provided is the very defective one of ground plates. These plates were placed in the ground near the two river bridges. The driven wells in the power station are metallically tied together so as to act as ground plates.

When single-trolley roads were first constructed it was considered good engineering to use ground plates as a return medium for the current, but this is now considered a menace rather than an advantage to the successful operation of the system, because they have a tendency to divert the return currents to the submetallic structures, such as water and gas pipes and other iron or metal.

REMEDIES.

The testimony in this case shows that the plaintiff is powerless to adopt any method whatever to protect its piping system. On the other hand, a single-trolley street railroad, such as the defendant operates, can adopt no method by which the tendency of the current to flow through the earth and on to the pipes can be entirely overcome. But I am of the opinion that by co-operation between the two such a system could be adopted as would reduce the injury resulting from electrolysis to a minimum, or negligible quantity, as the experts term it.

The defendant claims, however, that no system would prove effective as long as the other roads continue to operate as they are, but the testimony shows that any preventive measure adopted by this company would reduce the liability to injury to that extent.

The rails should all be metallically connected by adequate bonding and the bonding well inspected frequently, and heavy copper cables should be used to conduct the current across the bridges and under the steam railroad crossings and intersecting railroad tracks. Return feeders of sufficient conductivity should connect the rails at various points to the negative bus-bar of the dynamo. This would increase the conductivity of the rail path and induce a much greater quantity of the current to flow thereon.

The ground plates which are still in use by the defendant should be removed, thus reducing the tendency of the current to flow to the underground metallic structures.

Having corrected the system by proper bonding and by proper rail return, there should be co-operation on the part of the Waterworks Board in permitting to be placed, as may be determined, at the proper places the necessary insulators in the piping system. A few or none may be required.

A system operated along these lines without insulators or pipe connections to the rails or dynamo has proved successful in Hartford, Conn., and in other cities where the conditions are somewhat similar to those existing in this city.

The officials of the city of Chicago have also acted upon this theory and have passed an ordinance making it unlawful for "any person, firm or corporation owning, operating or controlling any surface or elevated railroad or any street railway within the city of Chicago upon which cars are now or hereafter operated by electricity as a motive power, with a grounded return circuit for conveying electricity," to operate their system without a "metallic return circuit of such cross section and conductivity for conveying the current so used as a motive power that the maximum difference of potential will not at any time exceed 1 volt between any part of such metallic return circuit and any water pipes, gas pipes or other metals not installed for the purpose of forming a part of such metallic return circuit, and that there will not be a variation in difference of potential exceeding one-half volt between any two measurements made at the same time at points along and upon said metallic return circuit within a distance of 300 ft. or less from each other."

Similar regulations have been made in other cities in this country, and general regulations have been adopted by the different British boards of trade and by what is known as the Bristol Tramways Act; and it is now generally considered by practical and scientific men that if a difference of potential not higher than about 1½ volts is maintained in the positive district, and a difference of potential not higher than about 4 volts in the negative district, the pipes will be practically immune from damage.

I am satisfied, from a careful consideration of all the testimony, that if these remedies are applied with intelligence, according to the present state of the art, it is possible to establish and maintain, by careful and frequent inspections and electrical measurements, such a return for the current of the City Railway Company as will practically protect the water pipes of the city and be also a great saving to the railway company in the cost of operation.

SUMMARY OF FINDINGS.

Upon consideration of the entire matter I have come to the following summary of conclusions as to the law and the facts:

This court has no authority in law to compel a change in the system from the single trolley to the double trolley; and, if the same was warranted by the law, the facts would not justify such a change.

The defendant has been, and is, operating its road in a negligent manner, causing continual damage to the water pipes of the plaintiff, for which the plaintiff has no adequate remedy at law, and cannot by any practical method prevent such damage.

It is no excuse in law, and the facts would not justify the defense that other electric lines in Dayton are contributing to this or doing like damage (Spelling, Secs. 390-397; McClung vs. North Bend Coke Company, 9 C. C., 259; Meigs vs. Lister, 23 N. J. Eq., 199).

It is therefore the duty of the court to enjoin the defendant from so operating its railway and to compel it, within a reasonable time, to introduce such improvements in the system in order that the operation of the single-trolley system authorized by the franchise and contract will be in accordance with the present standard of the art of operating single-trolley roads. The plaintiffs shall co-operate to that end. All matters of detail can be arranged between counsel and the court in the final order. The costs will be adjudged against the defendant.

Decision on Back Franchise Taxes in Chicago

Under a recent decision in Illinois, public service corporations were required to be assessed for taxes on the true cash value of their capital stock. Previous to 1901 assessments have been made on the real and tangible property of street railway and other public service companies. The decision required not only a new basis of assessment for the year 1901, but collection for back tax for the year 1900. The State Board of Equalization, acting under compulsions of court, assessed the street railway companies of Chicago much higher for the year 1900 than they did a few days later for the year 1901. Suit was immediately brought by the Chicago companies to test the validity of the assessment of back tax for 1900, and a decision was handed down, April 4, by Judges Grosscup and Humphery. The court practically decided that the additional tax of 1900 was fixed under compulsion through fear of punishment and was therefore unfair. In the decision attention was called to the fact that within a few days of the assessment by the State board of about $2,500,000 for levy of back tax for 1900 on the corporations involved the same board fixed the taxes for the same corporations for 1901 at about $750,000 less. Therefore, the Federal judges argued that this tax which was fixed for 1901, and which was reached by the State board without any fear or compulsion, represented more closely the real estimate of the corporations' valuations. The amount of tax which should be paid the judges left to two masters in chancery and laid down certain rules for their guidance which will make the tax for 1900 practically equivalent to the tax for 1901.

The rules fixed for the reassessment of the properties in question for the year 1900 were as follows:

The basis shall be the true net earnings of the several complainants for the year covering April 1, 1900, proper allowance being made for depreciation and replacement, but not for extensions and reduced further by the amount of additional taxes that the enforcement of this rule produces. Upon this basis the value of complainants' capital stock, including franchises and tangible property, shall be capitalized on a ratio of 6 per cent; this equalized by reduction of 30 per cent, and then divided by five.

The sums thus produced will be regarded as the true reassessments for the year 1900.

Upon this the tax will be extended at the true rate for 1900, exclusive of interest and penalties, not to exceed 8.37 per cent, from which will be subtracted the taxes already paid, and the balance will be the sum allowed.

One of the main points of general interest in the decision is that the real question of the assessment of franchise is not what the value of single shares of stock were upon a given date, but that the real value of a property is "the stable value as an entirety."

Annual Meeting of the Metropolitan Elevated, Chicago

The Metropolitan West Side Elevated Railway Company stockholders held their annual meeting at Chicago, April 4. The statement of earnings and operating expenses for the company's fiscal year, which ended Feb. 28, is as follows:

EARNINGS		
Passenger		$1,695,243
Miscellaneous		58,070
Total		$1,753,313
EXPENSES		
Maintenance of way and works	$45,931	
Maintenance of equipment	80,057	
Conducting transportation	527,086	
General expenses	84,135	737,210
Surplus earnings		$1,016,103
CREDITS		
Balance from previous year		$54,090
Surplus earnings		1,016,103
Interest on balances and other credits to income		4,640
		$1,074,833
CHARGES		
Rental, Pennsylvania Company (crossing)	$11,900	
Rental, Union Consolidated	20,351	
Rentals, Union Elevated (loop)	169,870	
Taxes	149,335	
Interest on bonds	392,320	743,776
		$331,057
Accident Nov. 19, 1901		37,976
		$293,081
Dividends Nos. 4 and 5 (3 per cent)		261,243
Balance		$31,838

Balance sheet:

ASSETS		
Cost of road and equipment		$26,018,670
Bonds in treasury (turned over by purchasing committee for improvements and betterments)		192,000
Preferred stock (turned over by purchasing committee for improvements and betterments)		291,900
Securities in hands of purchasing committee for completion of reorganization		26,461
Cash		331,737
Material (fuel and supplies)		21,728
Due from individuals and companies		34,678
Due from agents		5,189
Other assets (unexpended insurance etc.)		15,096
Extensions	$1,290,580.12	
Less amount received from trustee on engineer's certificates	1,190,375.07	100,205
Total		$27,037,663
LIABILITIES		
Balance profit and loss		$31,838
Preferred stock		9,000,000
Common stock		7,500,000
Bonds		10,000,000
Coupons unpaid		107,500
Interest accrued, not due		32,693
Dividends uncalled for		87,167
Pay checks		25,582
Audited vouchers		85,247
Due individuals and companies		7,814
Taxes accrued, not due		129,875
Unused insurance		29,277
Unearned passenger balances (tickets sold, not used)		671
Total		$27,037,663

The increase in traffic was 7.12 per cent over the previous year. President MacAllister said in part:

"The increase in traffic is gratifying, and we have every reason to believe it will continue, judging from the looks of the improvements in the metropolitan territory, particularly in the district east of Center Avenue, where large manufacturing buildings are under construction, and at the ends of the lines, where rapid improvements are being made in the way of apartment buildings and residences of various kinds. The mileage of the railroad in operation did not change during the year, being as last reported, 37.28 miles of single track, yards not included, of which 32.90 is Metropolitan Railroad proper; the balance, 4.38 miles, is under lease with the Union Elevated Railroad Company and Union Consolidated Elevated Railroad Company.

"For the first half of the fiscal year we declared a two per cent dividend on the outstanding preferred stock of the company, which was paid Aug. 31, 1901. At that time we had every reason to believe, with our increased traffic, that we would be able to declare at least an additional two per cent at the end of the fiscal year, but, owing to the increased taxation and a serious calamity which occurred Nov. 19, 1901, we deemed it proper to declare a dividend for the last half of the fiscal year of one per cent.

"The accident of Nov. 19 was due to an unusual atmospheric condition, and in our opinion could not have been avoided in ordinary railway practice. The company had an unfortunate experience during the year in the matter of its taxes. We feel that the assessment this year is larger than was justified by the facts. The entire amount to be paid out for taxes, as well as on account of the accident of Nov. 19, has been deducted from income account.

"During the year we carried on the construction of two extensions, the Douglas Park and Garfield Park branches; the Douglas Park branch from about Campbell Avenue, between Twentieth and Twenty-First Streets, to West Fortieth Avenue, a distance of 1.85 miles, and the Garfield Park branch from West Forty-Eighth Avenue to West Fifty-Second Avenue, a distance of one-half mile. These two extensions will add additional length of 2.35 miles to our lines. On these extensions there will be eight additional stations, seven on the Douglas Park branch and one on the Garfield Park, at Fifty-Second Avenue, with improved terminal loops at the ends of both lines. We are aiming to have the Garfield Park line extension completed by the middle of April, in time for the needs of the Aurora, Elgin & Chicago Railroad, which will connect with our line at this point. A satisfactory traffic arrangement has been perfected with this company for a connection with their lines (which are almost completed), from Fifty-Second Avenue westwardly, passing through Cicero, Harlem, Waldheim and Concordia cemeteries; Maywood, Bellewood, Elmhurst, Lombard and Glen Ellyn to Wheaton, with branches from Wheaton, northwesterly through Wayne to Elgin, and in a southwesterly direction through Warrensville to a point near the west branch of the Du Page River, thence northwesterly to Batavia and southwesterly to Aurora, connecting at Aurora with the lines controlled by the same interests running southerly and northerly in the Fox River Valley, southerly from Aurora through Montgomery, Oswego, Yorkville and Bristol, and northerly from Aurora through North Aurora, Batavia, Geneva, St. Charles Clintonville, South Elgin, Elgin, Dundee, West Dundee and Carpentersville; these lines connecting with the lines to Chicago at Aurora, Batavia and Elgin. This railroad opens up a beautiful section of the country, and I think will prove a very beneficial connection for the Metropolitan road.

"The Douglas Park extension has opened up a thickly settled and heretofore inaccessible portion of the city and places your road in close touch with Douglas Park, one of the most attractive parks in the city of Chicago. To meet the requirements of these extensions thirty-eight coaches and eight motor cars were ordered during the early part of the fiscal year. A number of these cars have been received and are in service. Also an engine and generator of 3500-hp capacity was ordered for the power house, which will be in service in time for our needs when the extensions are completed. We had hoped to have the Douglas Park extension in operation in January of this fiscal year, but found it extremely difficult to get material owing to the immense amount of work being done in the various manufacturing institutions throughout the country, due to the general prosperity."

Storage Batteries for Seattle

The Electric Storage Battery Company, of Philadelphia, is soon to ship four batteries, gross weight 823 tons, to the Seattle-Tacoma Interurban Railway and Seattle Electric Company, Washington State.

One of these consists of 278 cells of "chloride accumulators," type "G-23," having 880 amps. capacity at the hour rate, and will be installed in the Post Street power station of the Seattle Electric Company for use, with the railway machinery, as a regulator of the fluctuating load and as a reserve. It will also be arranged so that the exciting current for the alternating-current machinery can be drawn from it temporarily in case of failure of the exciting sets. This plant generates part of its power by steam, and is taking the remainder from the Snoqualmie Falls Power Company.

The three remaining batteries are for use on the Seattle-Tacoma Interurban Railway, a new third-rail road now building, which will be operated from three sub-stations receiving 60-cycle, three-phase current at 25,000 volts. Two of these batteries will be each composed of 288 cells, type "G-17" accumulators, 640 amps. capacity at the hour rate, and one "G-15," 560-amp. battery, all three installed in "G-23" tanks and operated in connection with boosters differentially wound. The object of the interurban batteries is primarily to even up the extreme variation in load due to the acceleration of the trains, which are expected to reach a maximum speed of 60 m. p. h. in regular service.

Metropolitan Merger Case Decided

On April 8 Justice Gildersleeve, in the New York Supreme Court, vacated the temporary injunction granted by Justice Greenbaum to restrain the Metropolitan Street Railway Company from executing the lease by which it sought to transfer its properties and franchises to the Interurban Street Railway Company for a period of 999 years. The decision vacating the injunction was made in a denial of the application of Harry and Walter Content and Isidor Wormser, Jr., for a continuance of the temporary injunction. Immediately after the vacating of the injunction notices were mailed by the Metropolitan Street Railway Company and the Metropolitan Securities Company to each stockholder of the former, notifying them of their right to subscribe at par to the stock of the latter company to the extent of 45 per cent of their Metropolitan Street Railway holdings. Blank subscription forms and a transferable subscription warrant accompanied each notice. All subscriptions must be in by April 22. Copies of the lease were also filed with the authorities at Albany, New York and Westchester.

Isidor Wormser, Jr., who was a plaintiff in one of the actions against the road, said that his original suit did not contemplate the request for a preliminary injunction, and that he was satisfied to await the final outcome of the trial of the suit on its merits.

In his opinion, Justice Gildersleeve said, in part:

"That we may better understand the status of the Securities Company it is proper to state that under the agreements in force the Securities Company is entitled to receive from subscription to its stock $30,000,000, of which $23,400,000 is to be paid to the Interurban Company. The remaining $6,600,000 is retained by the Securities Company for the cost of acquiring the shares of stock and bonds of the Interurban Company, the People's Traction Company and the New York, Westchester & Connecticut Railroad Company, as above mentioned, and for other corporate purposes.

"The condition of the Metropolitan Company prior to the adoption of the plan which the directors are now seeking to carry out in respect of its liabilities and apparent necessities was substantially as follows, namely: It had a floating debt of about $11,000,000 and horse car lines that it was necessary to improve for the company's future by replacing them with electrical power and improved rolling stock, which change and improvements it is estimated would call for an expenditure of about $12,000,000. The management, therefore, were confronted with the necessity of raising a total fund of about $23,000,000.

"The Metropolitan Company had assets available for the purpose of raising the $23,000,000 as follows: About $8,000,000 par value of the Third Avenue Railroad Company's stock on which the Metropolitan Company has guaranteed a dividend, shortly to become due, and also claims against subsidiary lines approximating $13,000,000. The lease of the Third Avenue Railroad Company, held by the Metropolitan Company, had as yet proved unprofitable. What was the plan by which this sum of $23,000,000 could be provided, that, when carried out, would be most likely to result in the best interest of the stockholders of the Metropolitan Company? The directors decided that a sale of the foregoing securities and claims for $23,000,000 and a lease on a guaranteed rental of 7 per cent promised the best results.

"The court will not substitute its own judgment upon a business proposition for that of the directors and of a majority of the stockholders, provided they are acting honestly. I can find no evidence here that overreaches the presumption that the directors and majority stockholders are acting in good faith. It is urged by the plaintiffs that, instead of the plan adopted for raising the required $23,000,000 by a sale of securities and a lease on a guaranteed rental of seven (7) per cent, the directors should have undertaken to have secured the money from the stockholders of the Metropolitan Company by an increase of stock or a further issue of bonds, which, plaintiffs claim, could have been readily sold at par, and that it was practicable to procure $10,000,000 for Third Avenue Railroad Company stock. The reply to this by the Metropolitan Company is that if new stock were issued the present annual dividend at the rate of 7 per cent would have to be greatly reduced, and that if new bonds were issued an additional fixed charge would be incurred, and the dividends would likewise have to be reduced, and that a reduction of the dividend would greatly depreciate the market value of the stock, and that many investors, especially among small holders, would be seriously embarrassed by a reduction in income.

"Moreover, it appears that, with the fixed charges as at present, and with a guaranteed dividend upon the Third Avenue Railroad Company stock not yet payable, the Metropolitan Company was about $31,000 short last year of earning a dividend of 7 per cent. Furthermore, the Metropolitan Company alleges that other systems and methods of transportation, and the probability of additional taxes, are likely in the near future to impair its net earnings. We should not continue this line of argument.

"The fallacy of plaintiffs' claim that there is a merger and consolidation of the two companies is too apparent to call for discussion. The claim that the lease to the Interurban Company violates existing leases or agreement cannot be sustained.

"The lease must stand or fall on its own merits, wholly irrespective of the relations between the Securities Company and the Interurban Company or the option mentioned. It is true that if the lease becomes operative the stockholders are limited to an annual dividend of 7 per cent for 999 years, no matter how great the earnings and profits of the Metropolitan system may become. It is true that should the net earnings of the system in time exceed 7 per cent the holders of the stock of the Metropolitan Securities Company would get the benefit. These considerations, however, do not affect the bona fides of the plan now sought to be carried out by the Metropolitan Company.

"The discussion still turns upon the two points to which we first directed our attention, namely: 1. Is the lease void on its face for illegality? 2. In view of all the facts and circumstances disclosed on this motion, is the rental grossly inadequate and the plan a fraud upon the minority stockholders? These questions must be finally determined when the actions come to trial. I fail to find sufficient grounds to warrant a continuance of the injunctions pendente lite."

The Everett-Moore Situation

There is very little new in the Everett-Moore situation, but from the continued reports that this or that railway property is about to be sold it appears very evident that it is the fixed purpose of the bankers' committee in charge of affairs to disrupt the entire traction interests, leaving the syndicate in control of only the Federal Telephone property. It is common talk that the syndicate's interest in the Northern Ohio Traction Company will be sold out in a few days. It is believed, however, the prospective purchasers are parties who are already heavily interested in the property, so that there would be but little change in the ownership or management. The committee holds the common stock in this company at 37½ and the preferred at 87½.

The option recently given by the committee on the property of the Toledo Railways & Light Company has expired and other parties are negotiating for the property. It is stated in Toledo that an agent of the Philadelphia Guaranty & Trust Company, representing Eastern capitalists, has completed an inspection of the city lines, the Lake Shore Electric Railway and the Detroit & Toledo Shore Line, and has made a proposition to buy all three properties. The report has it that the bankers consider the Everett-Moore interests in these roads worth $14,000,000. The Philadelphia man is reported to have stated the figures were too high. The reports cannot be verified in Cleveland.

It is known that the syndicate has given an option to local parties on the proposed extension of the Cleveland, Painesville & Eastern Railway. The extension was to have been built from Painesville to Ashtabula, and it includes the electric light franchise in Geneva. The road is partially graded and the power plant is under construction. This would indicate that the Cleveland, Painesville & Eastern Railway is also to be sold.

Pennsylvania's New York Tunnel Bill Approved

Mayor Low, of New York, has approved the bill to permit the Pennsylvania Railroad to have a perpetual tunnel franchise, and which also provides for the building of railroad tunnels without the consent of the Rapid Transit Commission. However, Mayor Low wants the bill amended so as to meet the objections of the Rapid Transit Commission and enable it "to have at least so much oversight of new underground roads as to insure a consistent and comprehensive system of underground tunnels in the city, and to be able to prevent disastrous interference with the development of the subway system constructed at the city's expense."

President Cassatt, of the Pennsylvania Railroad, who was in New York early in the week, after a conference with Mayor Low, said: "Our engineers are about ready to report on the best methods to pursue. We shall start work early in the summer if our plans are perfected. It is our intention to begin the work at four points on the route, one in New Jersey, one in Long Island City and two in this city. We intend making a continuous tunnel from New Jersey to Long Island, connecting with the Long Island Railroad. This, of course, will go under both the North and East Rivers and under Manhattan, the only outlets on the island of Manhattan being at the two stations."

Municipal Ownership Vote in Chicago

At the city election held in Chicago April 1 a ballot was taken to determine the trend of public sentiment regarding municipal ownership of street railways. The vote resulted in 124,594 in favor of the proposition and 25,987 against it. On the question of municipal ownership of the gas and electric light plants the vote against the proposition was slightly larger. The vote does not in any way bind the Counеil to aet accordingly, but was taken to determine the sentiment of the voters with regard to the question, and will undoubtedly have considerable influence in shaping legislation in the near future.

The Scranton Strike Ends

The street railway strike at Scranton, Pa., after lasting six months and one week, was ended April 6 by an agreement between the Scranton Railway Company and its employees, in which the differences between the eompany and its employees were compromised. According to unofficial reports, it is stated that the company has agreed to take back all the strikers, they to resume their former places as soon as the tracks—many of which have been torn up—can be plaeed in condition again. The company, just prior to April 1, announced a new wage schedule, to become operative on that date, and the men who return to work will, it is said, be governed by the new rates, which are: For first-year men, 17½ cents per hour; for second-year men, 18½ cents per hour; for third-year men, 19½ cents per hour. The boycott against the company, which resulted in demoralizing traffic, will, of course, be raised.

The Scranton strike was declared Oct. 1, 1901, because the eompany discharged two dishonest conductors. The cause of the strike was lost sight of shortly after its declaration, and the appeal of the street railway union for aid resulted in the declaration of a boycott that was demoralizing in its effects. The strike has not only been one of the most stubbornly contested of street railway strikes, but in general effects it has been one of the worst in the history of the Lackawanna Valley.

Reception at Columbia University to Lord Kelvin

On April 21, the Monday following the installation of President Nieholas Murray Butler, the American Institute of Electrical Engineers and Columbia University will give a reception at the University in honor of the Right Honorable Lord Kelvin (Past President of the Royal Society, Honorary Member of the American Institute of Electrical Engineers and of the American Physical Society) and Lady Kelvin, in conjunction with the National Academy of Sciенees, the American Association for the Advancement of Science, the American Mathematical Society, the American Physical Society, the Astro-Physical Soeiety of America and the New York Academy of Sciences. To use the words of President Eliakim H. Moore, this event will be a "delightful expression of international scientific unity." The reception will be from 8:30 to 11 o'cloek in the evening, with speeches by four eminent scientists, and a response by Lord Kelvin. Owing to the limited space in the reception hall, tickets to this reception at first will be issued only to members and one lady. After the returns from the members for themselves, if the capacity of the hall will admit, guests may be invited by members. Persons desiring to attend the reception who are not members of any of the above societies will be given invitations by applying through members, if the eapacity of the hall will admit. Entrance will be via the gate on 119th Street and Amsterdam Avenue. The executive committee for the reception is: Dr. Francis B. Crocker, ehairman; Calvin W. Rice, Dr. Robert S. Woodward, F. P. Keppel, Dr. Arthur G. Webster, Prof. J. McKeen Cattell and T. Commerford Martin.

Sterling-Meaker Company at Newark

For several months this concern has been looking for a factory site where increased space could be had, with quick shipping facilities and all the requirements for growing and economical manufacture. One was finally chosen on Ogden Street, Newark, N. J., close to the Lackawanna Railroad and on the Passaic River. The Pennsylvania, Erie, Lehigh Valley and Jersey Central roads are conveniently near, while two steamboat express lines connect daily with all points in New York. A four-story brick faetory, 47 ft. x 145 ft., is being erected on the site and fitted up for the needs of the company, which will oecupy the building on May 1 and be prepared, by its enlarged and improved facilities, to handle its growing business more promptly than heretofore. Newark has doubled its manufactures in the last ten years. It possesses many advantages and is rapidly becoming a great center of industrial and financial aetivities. The Sterling-Meaker Company manufactures at present the Sterling safety brake, six types of fare registers, the Sterling sand box and fender and the Earll trolley retriever.

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 MARCH 25, 1902.

695,953. Electric Trolley; C. E. Smith, Fall River, Mass. App. filed Nov. 4, 1901. A retractive mechanism is tripped into operation when the trolley pole rises above the wire.

695,988. Electric Railway; G. T. Woods, New York, N. Y. App. filed Aug. 24, 1900. Details of an electromagnetic switching device for successively energizing the conductor sections.

695,997. Trolley Wheel Retainer; A. E. Barton, Ravenna, Ohio. App. filed Dec. 3, 1900. Two rollers are spring-mounted above the wheel to prevent it from leaving the wire.

696,023. Electric Railway; E. W. Farnham, Chicago, Ill. App. filed Sept. 23, 1901. Means for mounting a swinging rail which, when engaged by a device carried by the ear, eompletes the circuit.

696,095. Car Seat; G. W. Dryer, New York, N. Y. App. filed July 12, 1901. Relates to the system of leverage for shifting a walkover seat.

696,220. Combined Easement and Point Proteetor; C. O. Anderson, Los Angeles, Cal. App. filed Sept. 7, 1901. A plate to be adjusted at the ends of splicing sleeves to ease the wheel over the sleeve and prevent damage from the blow which is usually delivered by the trolley wheel against the end of the sleeve.

696,237. Controller for Electric Railways or Vehicles; J. C. Henry, Denver, Col. App. filed Dec. 14, 1899. In a series parallel controller where the fields and armatures are ordinarily connected in series, contacts arranged for disconneeting one of the motors from the eircuit and connecting its field in parallel with the field of the other motor and subsequently eonnecting its armature to the circuit is parallel with the other armature.

696,248. Life-Saving Device for Street Cars; W. H. Martin, San Francisco, Cal. App. filed May 23, 1901. A car fender operating on the principle of a clam shell. The obstruction is received between two hinged seoops, which close and lift it from the traek.

696,286. Side Bearing for Railway Cars; J. C. Wands and F. R. Carnwall, St. Louis, Mo. App. filed Nov. 19, 1901. The top bearing rests directly upon a row of balls and is shaped to hold them in place in their groove.

696,313. Electrically Controlled Railway Switch; R. V. Cheatham, Louisville, Ky. App. filed Dec. 5, 1901. The circuits are so arranged that when it is desired to run the car along the main traek it is merely necessary for the motorman to cut off the current at the eontroller and allow the car to move by its momentum; to run the car on to a branch the motorman leaves the current on. These operations are followed regardless of the position of the switeh tongue.

696,376. Railroad Crossing; W. R. Macklind, St. Louis, Mo. App. filed Aug. 10, 1901. A crossing constructed to avoid jolting the cars and having a renewable wearing surface secured to a suitable base.

696,385. Side Bearing for Railway Cars; J. C. Wands, St. Louis, Mo. App. filed Nov. 19, 1901. The rollers are provided with axles of different size, which are supported upon tracks in sueh manner that the relative travel of the upper member as eompared to the distance of movement of the rollers in a horizontal direction is in the ratio of the length of the diameter of the enlarged portions of the rollers to the length of the diameter of the reduced portion or axles of the rollers.

696,388. Side Bearing for Railway Cars; D. P. Bosworth, Marietta, Ohio. App. filed Dec. 27, 1901. The raceway for the balls is in the upper bearing and is dovetailed in shape to hold the balls in place.

UNITED STATES PATENTS ISSUED APRIL 1, 1902

696,408. Convertible Railway Car; J. A. Brill, Philadelphia, Pa. App. filed Jan. 8, 1901. In this convertible car the lower panels are adapted to receive the upper panels when a half-open car is desired, and both panels can be stored in the roof when the ear is to be entirely open.

696,409. Convertible Railway Car; J. A. Brill, Philadelphia, Pa. App. filed June 3, 1901. The sash and panel slide upward

into the roof space in separate grooves, the sash being forced ahead of the panel until it finds its proper place in the roof and then disengages with the panel, allowing the latter to go to its place.

696,511. Truck Bolster for Railway Cars; O. M. Stimson, Chicago, Ill. App. filed Sept. 1, 1900. Details.

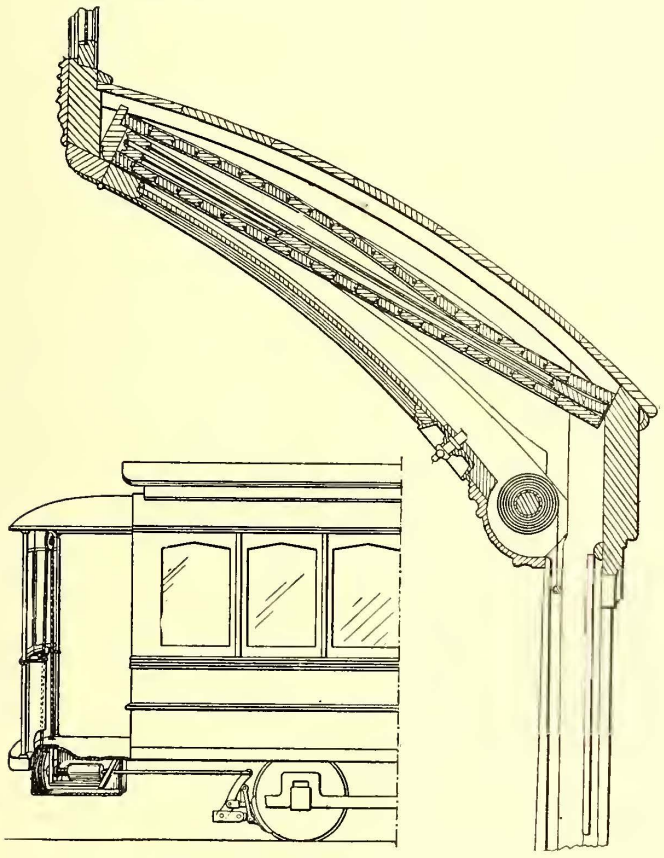
696,617. Car Truck; E. S. Woods, Chicago, Ill. App. filed July 27, 1901. Rollers are interposed between the top of the axle box and crown plates attached to the side frame, which affords independent lateral movement to the axle boxes.

696,627. Car Truck; E. A. Curtis, Chicago, Ill. App. filed June 5, 1901. A special construction of the equalizer bars whereby in the process of casting equal and uniform strength is secured throughout.

696,641. Car Truck; W. M. Johns, Dayton, Ohio. App. filed Jan. 4, 1902. The truck frame is in one integral piece.

696,653. Brake for Vehicles; W. G. Price, Kingston, N. Y. App. filed July 13, 1899. The frictional engagement between two disks centered upon the axle furnishes the braking force. These disks have four independent points of contact, which are self-adjusting with respect to the opposing faces, which permits of the rocking of the parts in order to compensate for inequalities of the mechanism.

696,741. Motor Car; J. G. Matthews, Three Rivers, Mich. App. filed Sept. 7, 1900. An explosive engine is located on each side of the car and between two car wheels; two pistons in the engine connect respectively with the wheels.



PATENT NOS. 696,901 AND 696,408

696,752. Means for Automatically Controlling Car Motors and Brakes; J. H. Robertson, New York, N. Y. App. filed July 25, 1899. The power is shut off and the brake applied automatically when the motorman, for any reason, steps off an auxiliary platform upon which he ordinarily stands in controlling the car.

696,901. Car Brake; C. B. Fairchild, New York, N. Y. App. filed July 2, 1901. The brake levers are moved by rotating a drum which is under the control of the motorman, who pulls on an endless rope passing around the drum.

ENGINEERING SOCIETIES

THE NEW YORK RAILROAD CLUB.—The Club will hold its regular monthly meeting at 349 Madison Avenue, on the evening of Thursday, April 17, at 8 p. m. The paper of the evening will be entitled "Maximum Trains; Their Relation to Track, Motive Power and Traffic," and will be presented by E. E. R. Tratman. It is greatly desired at this meeting that street railway men take an active part in the discussion, as this is a subject in which the city superintendent or track master who has interurban cars entering his district is particularly interested.

THE ELECTRIC CLUB.—This is a new society which has been organized by the engineers and apprentices of the Westinghouse Electric & Manufacturing Company, at Pittsburgh, Pa. Many of the employees of this company are college graduates, and, feeling the necessity for closer union and co-operation, they formed The Electric Club, with 150 charter members at the inaugural meeting a short time ago. Since then the membership has nearly doubled and comfortable and commodious quarters have been secured at 735 Penn Avenue, Wilkinsburg. The club is supported by the dues of the members, supplemented by subscriptions from the company, and the new association rooms include a lecture hall, reading, recreation and class rooms. The prospects of the club are most pleasantly assuring, and the STREET RAILWAY JOURNAL congratulates the incorporators on their success in this most useful undertaking.

PERSONAL MENTION

MR. N. H. BROWN has recently been appointed general manager of the Rapid Transit Company, of Chattanooga, Tenn., succeeding Mr. R. W. King.

MR. THOMAS E. GAULT, who has been for some time in the employ of the Portland City & Oregon Railway Company, has just been advanced to the post of master mechanic of the company's shops at that place.

MR. D. A. BELDEN, formerly of Aurora, Ill., but who has been general manager of the Atlanta Rapid Transit Company and the Atlanta Railway & Power Company for some few months, has been appointed general manager of the railway interests of the Georgia Railway & Electric Company, which controls all the street railway lines in Atlanta, Ga., as well as the lighting and steam heat interests.

MR. E. R. GILBERT, general manager of the Chicago Electric Traction Company, of Chicago, has just been appointed general manager of the Miami & Erie Canal Transportation Company, with headquarters in Cincinnati. Mr. Gilbert will assume his new position April 16. This Miami Company will have an electric road on the banks of the Miami and Erie Canal from Cincinnati to Dayton in operation by July 1, 1902, and the company contemplates later an extension across the State to Toledo.

MR. J. B. HAMILTON, who has recently been elected general manager of the City Tramways, of Leeds, England, is making a short tour in this country for the purpose of inspecting American methods of electric railway operation. Previous to his acceptance of the management of the Leeds Tramways, Mr. Hamilton was assistant manager of the Glasgow Corporation Tramways. He was connected with the later company for eight years, during which time the system has been changed from horse to electric power.

MR. J. L. MATSON, who until recently was assistant master mechanic of the Union Traction Company, of Indiana, has been appointed general master mechanic, which office was recently vacated by Mr. J. S. Hamlin. Mr. Matson has had a varied experience in steam and electric railways, dating back as far as the early eighties, having secured his apprenticeship in the Chicago shops of the Illinois Central Railway. He then became connected in an official capacity with the South Side Elevated Railway, Chicago, with whom he remained several years, helping, in 1896, to change the entire equipment of 180 cars from steam to electricity. He remained with the latter company until June 1, 1901, when he resigned to accept a position as assistant master mechanic of the Union Traction Company, of Indiana.

MR. R. E. DANFORTH, general manager of the Lake Shore Electric Railway Company, of Cleveland, Ohio, has resigned to accept a flattering offer from the Rochester Railway Company, of Rochester, N. Y. Mr. Danforth is generally recognized as one of the ablest young railway men of the country. He was formerly in charge of the lines of the International Traction Company, of Buffalo, and resigned this position to become connected with the Lake Shore Electric Railway Company when the company was being organized. Mr. Danforth was greatly handicapped in his work with the Lake Shore Company by lack of funds to place the road in paying condition. When it was placed in the hands of a receiver, at the time of the Everett-Moore embarrassment, his authority was curtailed considerably, so that his resignation followed on April 1. Mr. Danforth's duties on the Lake Shore will be assumed by General Superintendent Stout.

FINANCIAL INTELLIGENCE

THE MARKETS

The Money Market

Wall Street, April 9, 1902.

The renewal of gold exports with Monday's engagement of $2,500,000 for Paris was by no means unexpected. Sterling exchange has been steadily hardening during the last fortnight, and with last week's fall in the rate at Paris conditions were developed which have made it profitable to ship gold to that center. There is only a very small profit in the operation, however, and should local money rates advance any further, as they have begun to do during the last two days, the movement will not be continued. Indeed, gold exports, with the surplus bank reserves down to the exceptionally low figure of $2,450,000, are wholly unnatural. Were the demand for money at the foreign centers really urgent, and were the foreign banks offering special inducements to American shippers, as they sometimes do, then undoubtedly the foreign credits outstanding here would be withdrawn regardless of the effect upon this market. But no such imperative need as this exists or is likely to exist at present on the other side of the water. What will happen is that the higher money rates accompanying the low New York bank reserves and the announcement of the gold engagements will lead to the renewal of "sterling loans" in the local market. That is to say, foreign banking representatives in this city will draw exchange against their credits abroad and sell it here, thus depressing sterling rates below the gold shipping level. But even when this has been done the situation will be far from a state of even comparative ease. Relief will have to be sought through the agency of the trust companies converting their deposit liabilities at the Clearing House into an equivalent of ready lendable capital, which will go to supply the needs of current borrowers and coincidentally strengthen the reserve position of the Associated Banks. At the same time the rise in local money rates must be depended upon to attract currency in increased quantity from other domestic centers. In these ways the surplus reserve may be gradually built up, but it is a *sine qua non* of this that money continues at a high level for some time to come.

The Stock Market

The stock market has been enlivened by some aggressive operations for the rise by a clique of Western operators with abundant means and powerful connections; but this is about all that is to be said of the dealings of the past two weeks. Favorable reports from the winter wheat sections, indicating that the crop is above the average for the season, have been the main inspiration of the movement, and, on the other hand, the hardening tendency of the money market has been the main impediment. It is plain on the one side that the floating supply of stocks in the majority of cases is comparatively small, and on the other side it is equally plain that neither the outside public nor the really solid financial interests are willing to contribute much of an increase to the buying power. The situation, accordingly, is favorable, as the dealings of the last fortnight have shown, to the temporary success of manipulation for the advance, with frequent and rather sharp reactions intermingled. Nothing like a general forward movement, based on a genuine investment demand, however, is indicated at present. What the market awaits more than anything else is the satisfactory development of the crops, and when this is assured the operations for a rise will have stronger claim upon popular favor than they now have. But in the meantime the continuation of the speculative buying in individual stocks may fairly be expected.

The local traction stocks are not enjoying any great degree of activity, but they are holding very well, and are disposed to move up easier than they go down. Yesterday's preliminary decision in favor of the Metropolitan majority interest in the lease injunction suit was generally assumed to foreshadow a similar judgment when the final opinion is handed down. As the case now stands, the minority complainants have been denied their application to continue the temporary injunction now outstanding, but the court has not yet passed upon the important point at issue, which is the right of the Metropolitan majority holders to transfer the property and equities to the Interurban Company. Metropolitan shares are inactive, pending the settlement of the matter, but the "rights" to subscribe to the new Metropolitan Securities stock advanced from 11½ to 12¼ on the news of yesterday's decision, and the stock itself, "when issued," rose from 126 to 126½. Manhattan Elevated continues to be well bought on every slight reaction. The company's forthcoming quarterly report will, it is understood, show earnings of 2 per cent on the stock for the quarter, or at the rate of 8 per cent for the year. Brooklyn Rapid Transit is well supported, and acts as if it would sympathize readily with any advance in the other tractions.

Philadelphia

Union Traction has sold during the past week within one-half point of the highest price on record. At 44¼, which was the maximum level, the stock showed an advance of 4 points over two weeks ago, and of 14 from the current figure of three months ago, when rumors of the impending lease of the property to a new corporation began to be circulated. The impatience of speculators and investors is sorely tried by the continued withholding of the much-desired information concerning the details of the lease project. What the reason for the delay may be is the subject of much conjecture, both good and bad, but it is only natural that the persistent advance in the shares without fresh news accompanying it should arouse suspicion that "insiders" are not prepared to take the public into their confidence until the market for the stock has reached a level suitable to the distribution of speculative holdings. It is the common belief that there will be valuable subscription privileges in connection with the conversion plan, and some private bids for these rights are even reported at $4 in the 100. Philadelphia Traction has not sympathized as it usually does with the rise in Union Traction, but has hung motionless around 98. Transactions in the rest of the traction list have been exceedingly unimportant. Fairmount Park Transportation, continuing its recent upward movement, has risen to 26, and odd lots of Consolidated of New Jersey at 70¼, American Railways at 44 and Easton Consolidated Electric at 19½ are recorded. In bonds, Electric-People's Traction 4s have been active around 98½, and smaller sales have occurred in Indianapolis Railway 4s at 85, Union Traction of Indiana 5s at 101¼, People's Passenger 4s at 106¾ and 107, and Wilmington & Chester 5s at 108¼.

Chicago

Union Traction issues have moved with a good deal of irregularity, but a tendency has developed to take profits on the idea that the recent rise has so far not been justified by any actual announcement concerning the franchise tax matter. Judge Grosscup's decision, which virtually prevents the city from collecting the increased assessments on the tax for 1900, was considered important, but its effect upon the market was only temporary. The common stock has dropped back from 19¼ to 18¾, but the preferred is up from 56 to 58. No transactions at all have been recorded recently in City Railway. West Chicago is steady, though inactive at par. The elevated line stocks have changed very little during the two weeks under review. Northwestern Elevated preferred is rather heavy at a reaction from 86 to 85½, Lake Street is firm around 12⅝, and South Side is firm with only a few sales reported at 114¼. Metropolitan, after selling as high as 41¾, is back to 39½, but the preferred is steady around 92. The company showed a gain in traffic during its last fiscal year of 7⅛ per cent, with a gain of 2,253,818 in the number of passengers carried.

Other Traction Securities

The feature of the Boston trading of the last ten days was the heavy buying of Massachusetts Electric common at an advance from 37 to 41¼. The preferred rose at the same time 1½ points to 98. It is said that the purchases have come mainly from people who have means of knowing the plans of the management, and that when these plans for developing the assets of the company are made public they will be found to fully justify the higher price level. Not much has been done in Boston Elevated, which has kept merely steady around 168. Except for the 4 per cent general mortgage bonds, which are up from 94¾ to 95⅝, the Baltimore United Railways securities have not changed their position at all during the last fortnight. The common stock and the income bonds are steady around 16¾ and 71½, respectively. Other Baltimore sales include Charleston Electric 5s at 89¼, Knoxville Traction 5s at 97, Norfolk Railway stock at 10½, Nashville Railway 5s at 65¼ and Norfolk Railway 5s at 111¾. Syracuse Transit preferred, which has been quoted for some time past at 60 bid, no sales, is now down to 54 bid. Columbus Railway common has reacted from 54 to 51½. St. Louis Transit sold on the New York curb a week ago at 31¾, but no transactions have been reported since then. Twin City Rapid Transit and North American have both continued active and strong on the Stock Exchange, the move in the former being explained by the increase in the dividend rate from a 4 per cent to a 5 per cent annual basis. San Francisco securities have received less attention in the local curb dealings, but quotations are

well maintained at 23⅞ for the common, 62⅛ for the preferred, 101⅞ for the subscription "rights" and 90 for the bonds.

There was another quiet week on the Cleveland Stock Exchange. About 225 shares of Cleveland Electric sold at 83 and 83¾, a gain of ¼ over last sale of previous week. One hundred shares of Cleveland City sold at 106¾, stationary price. About 825 Northern Ohio Traction common went at 33, a drop of 1 point. There is much interest in this stock, but few offers, as it is very uncertain what the Everett-Moore Syndicate proposes doing with the property. Southern Ohio Traction was the most active stock on the list, something over 300 shares going at 62-64¾, a gain of about 5 points from last sales. Monday 500 shares of Southern Ohio Traction sold at 63¾ and 63. One hundred Cleveland Electric sold at 83½.

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	
	March 26	April 8
American Railways Company	†43	43⅝
Boston Elevated	167	168½
Brooklyn R. T.	65¼	65⅝
Chicago City	223	220
Chicago Union Tr. (common)	19¼	19⅜
Chicago Union Tr. (preferred)	56	57
Cleveland & Eastern	a30	a30
Cleveland Electric	83½	82¾
Columbus (common)	54	51½
Columbus (preferred)	102	102
Consolidated Traction of N. J.	70	70¼
Consolidated Traction of N. J. 5s	110½	110½
Consolidated Traction of Pittsburgh (common)	24½	24⅜
Detroit United	67	66
Electric-People's Traction (Philadelphia) 4s	98¼	98⅜
Elgin, Aurora & Southern	34	35
Indianapolis Street Railway 4s	†85	85
Lake Street Elevated	12½	12⅜
Manhattan Ry	133½	134½
Massachusetts Elec. Cos. (common)	37	39½
Massachusetts Elec. Cos. (preferred)	96½	96
Metropolitan Elevated, Chicago (common)	41	39½
Metropolitan Elevated, Chicago	91	91
Metropolitan Street	167½	165
New Orleans (common)	30½	30
New Orleans (preferred)	104¾	104
North American	124½	125¼
Northern Ohio Traction (common)	35	51
Northern Ohio Traction (preferred)	a87½	a84¾
North Jersey	30	30
Northwestern Elevated, Chicago (common)	39	37
Northwestern Elevated, Chicago (preferred)	86	85½
Philadelphia Traction	97¾	98
St. Louis Transit Co. (common)	30¼	30⅝
South Side Elevated (Chicago)	a115	a114½
Southern Ohio Traction	a60	62⅞
Syracuse (common)	20	21
Syracuse (preferred)	60	54
Third Ave.	130	130
Twin City, Minneapolis (common)	114¾	120¼
United Railways, St. Louis (preferred)	85	83¾
United Railways, St. Louis, 4s	89	88¾
Union Traction (Philadelphia)	40	43¾

† Last sale. (a) Asked.

Iron and Steel

The effort of the leading interests in the steel trade to hold the market in check has been rendered more difficult by the action of the Bessemer Association of Furnacemen in demanding higher prices for their second half-year tonnage supplied to the Steel Corporation. According to the *Iron Age* this is not a serious demand so far as the effects on manufacturing profits go, inasmuch as contracts for finished goods are arranged on a sliding scale of prices for the raw materials. But what the Steel Corporation chiefly fears is the influence of the higher prices of pig iron on sentiment. The struggle to maintain control over the market still continues in this and other ways, with the outcome still much in doubt. Quotations are $17.75 for Bessemer pig iron, $31.00 for steel billets and $28 for steel rails.

Metals.

Quotations for the leading metals are as follows: Copper, 12⅛ cents; tin, 26⅝ cents; lead, 4⅛ cents, and spelter, 4.40 cents.

EAST ST. LOUIS, ILL.—The Secretary of State has been notified of the consolidation of the Belleville & Suburban Railway Company and the Belleville Electric Railway Company. The consolidated companies are known as the East St. Louis Suburban Railway Company. The capital stock of the company has been increased from $300,000 to $2,975,000.

LOGANSPORT, IND.—The Wabash River Traction Company has purchased the Logansport Street Railway.

SPRINGFIELD, MASS.—The Springfield & Eastern Street Railway Company has petitioned the Railroad Commissioners for authority to issue bonds to the amount of $350,000. The bonds are to be issued for the purpose of funding the company's floating debt and improving its system.

WAREHAM, MASS.—The Middleboro, Wareham & Buzzard's Bay Street Railway Company has petitioned the Railroad Commissioners for authority to increase its capital stock by $75,000.

CONCORD, MASS.—The Concord, Maynard & Hudson Street Railway Company has petitioned the Railroad Commissioners for authority to issue additional capital stock to the amount of $65,000.

WORCESTER, MASS.—The directors of the Worcester Consolidated Street Railway Company have voted to call in the bonds of the Worcester & Suburban Street Railway Company and the Leominster & Clinton Street Railway Company. There are outstanding $200,000 of bonds of the Worcester & Suburban road, redeemable at 104, and $143,000 of bonds of the Leominster road, redeemable at 105. The bonds will be taken up with a part of the proceeds from sale of stock of the Consolidated Street Railway Company to the Worcester Railways & Investment Company.

PITTSFIELD, MASS.—It is stated that the Berkshire Street Railway Company and the Pittsfield Street Railway Company are to be consolidated. Both companies at present operate in the city, and both have recently been granted franchises for extensions. The general opinion is that the consolidation would be highly beneficial.

SAGINAW, MICH.—The Saginaw Suburban Railroad Company has issued bonds to the amount of $800,000, and reports that its line will be completed and in operation from Bay City to Flint by Sept. 1.

GRAND RAPIDS, MICH.—The Grand Rapids, Holland & Lake Michigan Railway has been transferred to a new syndicate. John Winter and Dr. O. H. Lau retire from the company. Ben S. Hanchett, Jr., of Grand Rapids, becomes the new president, and Strathearn Hendrie, of Detroit, becomes treasurer and general manager. The bulk of the stock has been acquired by I. E. Cochran, of Chester, Pa., who held a large block of the company's first bonds. W. J. Rawson, of New York, holds a large amount of the stock for Western banks that had bought the company's bonds and wanted to protect them by making sure that the road would be completed.

DETROIT, MICH.—After a meeting held a few days ago to consider the sale of the Detroit United Railways Chairman Newcomb made the following statement: "We lacked about 10,000 shares of making the plan successful. The syndicate has only 40,000 shares, which is not a controlling interest. We were assured by the Cincinnati and Baltimore people who were after the property that if we could get 50,000 shares they might consider the purchase of the property at $75 a share. Shareholders are evidently of the opinion that the stock is worth more than this, for they refuse to part with their holdings at that figure."

MINNEAPOLIS, MINN.—The directors of the Twin City have declared a 1¼ per cent quarterly dividend on the common stock, payable May 15. The dividend of 1¼ per cent puts the stock on a 5 per cent basis, an advance of 1 per cent annually, as the previous dividend was 2 per cent semi-annually.

OMAHA, NEB.—Notices of stockholders' meeting of the Omaha Street Railway and the Omaha & Council Bluffs Railway & Bridge Companies have been issued. It is understood the question of merging the two properties will be brought up. For many months past there have been periodic rumors of the consolidation of the street railway, electric light and water companies of Omaha and Council Bluffs.

BROOKLYN, N. Y.—The Brooklyn Rapid Transit Company reports earnings as follows:

January	1902	1901
Gross receipts	$996,824	$917,750
Expenses, including taxes	784,360	663,893
Net receipts	$212,464	$253,857
Seven months ending Jan. 31:		
Gross receipts	$7,533,752	$7,055,706
Expenses, including taxes	5,300,232	4,565,944
Net receipts	$2,233,520	$2,489,762

TOLEDO, OHIO.—The Eastern syndicate that had an option on the Everett-Moore interests in the Toledo Railway & Light Company has obtained a renewal of the option for fifteen days.

SPRINGFIELD, OHIO.—It is reported that the Dayton, Springfield & Urbana Railway Company is negotiating for the purchase of the Springfield Railway, which is owned by the American Railways Company, of Philadelphia. The only objection to the deal is that the city lines are broad gage, which would have to be made narrow for the use of the interurban cars.

CINCINNATI, OHIO.—All of the old stock and bonds of the Cincinnati, Georgetown & Portsmouth Railroad, now being equipped with electricity, have been retired, and new issue of stock to the amount of $1,500,000 has been made; also a new mortgage to secure $1,000,000 of 5 per cent gold bonds go to provide for improvements. Of these bonds, $200,000 will be reserved for extensions. The Union Savings Bank & Trust Company, of Cincinnati, is trustee under the mortgage.

PROVIDENCE, R. I.—The Senate has passed the act which incorporates under the title of the Rhode Island Company the United Traction, the Narragansett Electric Lighting and the Providence Gas Companies, with a combined capital of $16,000,000. The amount of capital stock mentioned in the act is $2,000,000, and power is given to increase this at any time it becomes desirable.

MONTREAL, QUE.—The Montreal Street Railway Company has declared the quarterly dividend of 2½ per cent for the three months ending March 31, payable May 1.

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
AKRON, O.						
Northern Ohio Tr. Co.	1 m., Feb. '02	41,643	27,531	14,112	12,500	1,612
	1 " " '01	35,348	22,253	13,095	10,417	2,679
	2 " " '02	89,930	56,715	33,215	------	------
	2 " " '01	80,979	53,985	26,994	------	------
	12 " Dec. '01	617,011	*350,845	266,166	136,162	130,004
	12 " " '00	513,725	*317,475	196,249	141,133	55,117
ALBANY, N. Y.						
United Traction Co.	1 m., Mar. '02	115,652	86,131	29,521	23,453	6,067
	1 " " '01	111,194	75,405	35,788	19,901	15,887
	9 " " '02	1,098,699	756,239	342,460	192,220	150,240
	9 " " '01	1,031,188	699,485	331,703	179,532	152,171
AUGUSTA, GA.						
Augusta Ry.& Elec.Co.	1 m., Oct. '01	18,031	10,012	8,019	------	------
	1 " " '00	15,772	9,668	6,104	------	------
	10 " " '91	169,950	102,279	67,671	------	------
	10 " " '00	157,049	91,785	65,264	------	------
BINGHAMTON, N. Y.						
Binghamton St. Ry. Co.	1 m., Feb. '02	12,451	9,421	3,030	------	------
	1 " " '01	12,358	8,538	3,820	------	------
	8 " " '02	77,851	44,928	32,923	------	------
	8 " " '01	70,766	39,614	31,151	------	------
BOSTON, MASS.						
Boston Elev. Ry. Co.	12 m., Sept.'01	10,869,496	7,336,597	3,532,899	2,896,359	636,539
	12 " " '00	10,236,994	6,828,110	3,408,884	2,932,839	476,044
Massachusetts Elec. Cos	12 m., Sept.'01	5,778,133	3,915,486	1,862,648	937,206	925,442
	12 " " '00	5,518,837	3,659,337	1,859,500	994,294	865,206
BROOKLYN, N. Y.						
Brooklyn R. T. Co.	1 m., Jan. '02	996,825	* 781,361	212,464	------	------
	1 " " '01	917,750	* 663,893	253,857	------	------
	7 " " 02	7,533,752	*5300232	2,233,520	------	------
	7 " " '01	7,055,707	*4565945	2,489,762	------	------
	12 " June '01	12,135,559	*7216008	4,919,551	4,341,748	577,803
	12 " " '00	11.768,550	*7106373	4,662,177	4,135,405	526,772
BUFFALO, N. Y.						
International Tr. Co.	1 m., Feb. '02	230,744	132,920	97,824	94,276	3,548
	1 " " '01	235,021	118,273	116,748	84,411	32,338
	8 " " '02	3,519,491	1,664,285	1,855,206	789,124	1,066,081
	8 " " '01	1,998,050	972,319	1,025,731	641,057	384,674
CHICAGO, ILL.						
Chicago & Milwaukee Elec. Ry. Co.	1 m., Feb. '02	9,552	5,646	3,876	------	------
	1 " " '01	6,731	5,584	1,147	------	------
	2 " " '02	20,476	11,520	8,957	------	------
	2 " " '01	14,963	11,223	3,740	------	------
Lake Street Elevated	12 m., Dec. '01	786,462	388,799	397,663	------	------
	12 " " '00	757,954	378,661	379,293	------	------
CLEVELAND, O.						
Cleveland & Chagrin Falls	1 m., Feb. '02	3,454	2,255	1,199	------	------
	1 " " '01	2,435	3,016	† 581	------	------
	12 " Dec. '01	47,976	* 32,002	15,974	13,023	2,951
	12 " " '00	49,646	* 33,272	16,374	13,294	3,080
Cleveland & Eastern	1 m., Feb. '02	4,916	3,616	1,300	------	------
	1 " " '01	3,525	4,037	† 512	------	------
	12 " Dec. '01	90,390	52,022	38,368	43,678	† 4,310
	12 " " '00	62,893	36,672	26,221	36,148	† 9,927
Cleveland El. Ry. Co.	1 m., Feb. '02	168,462	97,446	71,016	22,170	48,846
	1 " " '01	151,805	90,251	61,554	18,875	42,679
	2 " " '02	356,544	203,452	153,092	43,945	109,146
	2 " " '01	318,537	189,514	129,023	37,851	191,172
	12 " Dec. '01	2,296,898	1,265,953	1,030,945	244,231	786,714
	12 " " '00	2,061,505	1,121,037	940,467	258,483	681,984
Cleveland, Elyria & Western	1 m., Mar. '02	22,071	12,969	9,102	------	------
	1 " " '01	17,425	10,836	6,589	------	------
	3 " " '02	57,084	38,369	18,715	------	------
	3 " " '01	47,030	33,873	13,156	------	------
	12 " Dec. '01	249,260	136,865	112,394	57,023	55,371
	12 " " '00	179,698	102,393	77,304	34,562	42,742
Cleveland, Painesville & Eastern	1 m., Feb. '02	8,918	5,893	3,025	6,258	† 3,234
	1 " " '01	7,807	4,926	2,881	6,042	† 3,161
	2 " " '02	19,119	12,314	6,805	------	------
	2 " " '01	16,841	10,363	6,478	------	------
	12 " Dec. '01	164,971	* 87,102	77,869	72,500	5,369
DENVER, COL.	12 " " '00	141,112	* 89,592	71,520	72,500	† 980
Denver City Tramway Co.	1 m., Feb. '02	112,666	64,769	47,897	32,621	15,275
	1 " " '01	98,403	56,596	41,806	31,642	10,164
	2 " " '02	232,308	129,053	103,316	65,647	37,669
	2 " " '01	206,814	113,487	93,327	63,013	30,314
	12 " Dec. '01	1,507,293	818,321	688,965	383,180	305,785
DETROIT, MICH.	12 " " '00	1,302,290	722,458	579,839	374,291	205,548
Detroit & Port Huron Shore Line	1 m., Nov. '01	27,979	17,447	10,532	9,466	1,066
	1 " " '00	25,039	16,921	8,118	9,692	------
	11 " " '01	355,195	206,052	149,143	106,163	42,980
	11 " " '00	262,800	151,503	111,297	71,623	39,674
Detroit United Ry.	1 m., Feb. '02	230,917	135,056	95,861	64,785	31,076
	1 " " '01	199,776	115,281	84,496	57,360	27,135
	2 " " '02	486,943	282,780	204,163	128,944	75,220
	2 " " '01	420,383	240,701	179,682	114,704	64,977
	12 " " '01	2,919,171	*1596765	1,322,046	652,277	670,129
	12 " " '00	2,575,277	*1439058	1,136,219	616,468	519,751
Rapid Ry.	1 m., Dec. '01	30,984	* 17,678	13,306	9,692	3,614
	1 " " '00	27,873	* 18,735	9,138	9,692	† 554
	12 " " '01	386,624	* 223,730	162,894	116,300	46,954
	12 " " '00	290,673	* 170,237	120,436	81,315	39,121
DULUTH, MINN.						
Duluth-Superior Tr.	1 m., Feb. '02	33,419	20,780	12,639	9,563	3,077
	1 " " '01	29,308	18,895	10,408	9,064	1,344
	2 " " '02	70,121	43,939	26,182	19,228	6,954
	2 " " '01	61,551	38,385	23,166	18,180	4,986
ELGIN, ILL.						
Elgin, Aurora & Southern Tr.	1 m., Mar. '02	30,535	19,148	11,387	8,333	3,054
	1 " " '01	27,687	16,256	11,431	8,333	3,098
	10 " " '02	314,496	176,079	138,416	83,333	55,082
	10 " " '01	274,349	174,442	99,907	83,333	16,574
HAMILTON, O.						
Southern Ohio Tr. Co.	1 m., Mar. '02	27,698	15,040	12,658	7,500	5,158
	1 " " '01	23,297	13,462	9,835	7,500	2,335
	12 " Dec. '01	337,741	182,954	154,787	90,000	64,787
	12 " " '00	294,907	154,465	140,542	90,000	50,542
LONDON, ONT.						
London St. Ry. Co.	1 m., Feb. '02	8,895	6,558	2,336	1,999	338
	1 " " '01	8,146	5,973	2,173	1,740	432
	2 " " '02	19,012	13,637	5,375	4,248	1,128
	2 " " '01	17,402	12,574	4,828	3,777	1,051
MILWAUKEE, WIS.						
Milwaukee El. Ry. & Lt.	1 m., Feb. '02	195,974	94,527	101,447	62,693	38,754
	1 " " '01	169,183	95,080	74,103	58,359	15,745
	2 " Feb. '02	410,858	201,059	209,799	128,094	81,704
	2 " " 01	355,992	201,515	154.477	119,660	34,817
MINNEAPOLIS, MINN.						
Twin City R. T. Co.	1 m. Feb. '02	244,781	120,271	124,509	58,516	65,993
	1 " " '01	215,580	106,461	109,117	52,698	56,419
	2 " " '02	516,939	252,691	264,247	117,033	147,214
	2 " " '01	451,854	221,685	230,168	106,028	124,140
MONTREAL, CAN.						
Montreal St. Ry. Co.	1 m., Feb. '02	133,645	103 915	29,729	14,581	15,149
	1 " " '01	127,612	87,654	39,958	8,774	31,184
	5 " " '02	767,844	491,761	276,082	74,211	201,872
	5 " " '01	726,527	461,276	265,251	45,814	219,438
NEW YORK CITY.						
Manhattan Ry. Co.	3 m., Dec. '01	3,038,435	1,404,971	1,633,465	753,135	880,329
	3 " " '00	2,728,538	1,340,696	1,387,902	749,857	638,045
	12 " Sept. 01	10,455,872	5,328,649	5,127,223	2,683,132	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
	3 " " '00	3,786 030	1,699,649	2,086,381	1,138,467	947,914
	12 " June '01	14,720,767	6,755,131	7,965,636	4,534,068	3,431,567
	12 " " '00	14,437,134	6,631,254	7,805,880	4,445,720	3,360,160
OLEAN, N. Y.						
Olean St. Ry. Co.	1 m., Feb. '02	3,281	2,760	521	------	------
	1 " " '01	3,301	1,913	1,388	------	------
	8 " " '02	37,741	19,201	18,540	11,197	7,344
	8 " " '01	35,434	17,233	18,202	11,670	6,531
PITTSBURG, PA.						
Consolidated Traction	1 m., Dec. '01	304,669	140,941	163,728	91,548	72,180
	1 " " '00	277,439	109.069	168,370	89,807	78,563
	9 " " '01	2,649,656	1,145,651	1,503,905	807,667	694,238
	9 " " '00	2,471,696	1,013,240	1,458,456	799,704	658,752
PHILADELPHIA, PA.						
American Railways	1 m., Feb. '02	70,615	------	------	------	------
	1 " " '01	58,058	------	------	------	------
	2 " " '02	650,561	------	------	------	------
	2 " " '01	561,994	------	------	------	------
RICHMOND, VA.						
Richmond Trac. Co.	1 m., Sept. '01	20,991	15,669	5,322	3,196	2,126
	1 " " '00	20,727	10,770	9,957	3.843	6,115
	12 " " '01	218,569	139,542	79,027	38,618	40,410
	12 " " '00	203,057	108,198	94,859	37,608	57,250
ROCHESTER, N. Y.						
Rochester Ry.	1 m., Feb. '02	81,934	48,866	33,068	24,672	8,396
	1 " " '01	75,949	51,074	24,875	24,172	703
	2 " " '02	172,900	99,464	73,436	49,520	23,916
	2 " " '01	158,980	106,295	52,685	48,416	4,269
SCRANTON, PA.						
Scranton Ry. Co.	1 m., Oct. '01	2,638	29,300	adf26661	------	------
	1 " " '00	48,781	34,787	13.993	------	------
	10 " " '01	507,989	295,079	212,910	------	------
	10 " " '00	504,852	298,122	206,730	------	------
SCHENECTADY, N. Y.						
Schenectady Ry. Co.	3 m., Dec. '01	84,061	46,949	37,112	13,454	23,658
	3 " " '00	30,876	14,517	16,359	6,087	10,272
SYRACUSE, N. Y.						
Syracuse R. T. Co.	1 m., Feb. '02	52,901	30,775	22,126	19,025	3,101
	1 " " '01	47,676	26,540	21,136	18,588	2,548
	8 " " '02	458,390	251,952	206,439	152,146	54,293
	8 " " '01	404,872	222,231	182,641	148,928	33,714
TOLEDO, O.						
Toledo Ry. & Lt. Co.	1 m., Feb. '02	99,450	52,523	47,427	37,833	9,593
	1 " " '01	89,079	44,962	44,116	24,271	19,846
	12 " Dec. '01	1,311,084	* 636,407	674,677	415,168	259,509
	12 " " '00	1,182,517	* 616,945	565,572	409,051	156,521
W. NEW BRIGHTON, S. I.						
Staten Island El	1 m., Dec. '01	15,080	11,916	3,163	8,559	df.†5,396
	1 " " '00	13,177	11,237	1,940	8,333	†6,394
	6 " " '01	125,977	88,229	37,749	52,774	†15,025
	6 " " '00	120,277	76,395	43,882	52,348	† 8,466