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EDITORIAL NOTICE.

The news issues of the Street Railway Journal are devoted primarily to the publication of street railway news and current happenings related to street railway interests. All information regarding changes of officers, new equipments, extensions, financial changes and new enterprises will be greatly appreciated for use in its columns.

All matter intended for publication must be received at our office not later than Wednesday morning of each week in order to secure insertion in the current issue.

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Organization of the New England Street Railway Club

A number of street railway superintendents, as well as others interested in street railways, was held on Wednesday evening, July 18, 1900, at Young's Hotel, Boston, to discuss the arrangements for an outing some time during the month of September, to include all who are in any way interested in street railways, taking in all the New England States. There seemed to be a general feeling among the superintendents that such an outing would be a grand success, and of much mutual benefit, if all would take an interest in it. The meeting was a most enjoyable affair. There were about thirty-five gentlemen present, and it was decided to form the "New England Street Railway Club," the membership of which would be composed not only of operating railway men, but of all persons interested in street railway work. The following officers were elected: President, H. E. Bradford, Marlborough Street Railway Company, Marlborough, Mass.; vice-president, L. H. McLain, Newton & Boston Street Railway Company, Newtonville, Mass.; secretary, R. H. Derrah, Boston, Mass.; treasurer, George H. Burgess, Leominster & Clinton Street Railway Company, Leominster, Mass. The executive committee consists of the officers and F. G. L. Henderson, Newton Street Railway Company, Newton, Mass.; E. E. Potter, Union Street Railway Company, New Bedford, Mass.; J. F. Whetles, Boston, Mass.; W. G. Meloon, Portsmouth; Kittery & York Street Railway, Portsmouth, N. H., and D. F. Burritt, Palmer & Munson Street Railwaypany, Palmer, Mass.

As the club is formed for social purposes only, it will be quite distinct from the Massachusetts Street Railway Association, and will not interfere with the latter in any way. A meeting of the club will probably be held within a month to arrange for an outing some time during September.

Terrible Accident at Tacoma

An accident, worse than the Pecks Mills disaster of last summer, and probably the worst in the history of electric railroading, occurred at Tacoma, Wash., on July 4. A car crowded with passengers from South Tacoma and Spanaway Lake jumped the track at a high bridge crossing a gulch at Dehn and D Streets, falling a distance of 100 ft., and striking on its roof. The heavy motors and trucks crashed through the floor of the car, killing thirty-six persons and injuring about sixty. Other passengers would probably have suffered similar fate had they not jumped from the car when they saw that an accident was not to be averted.

The Chicago Street Railway Commission Recommends a Modified Form of Municipal Ownership

The Railway Committee of the City Council has declared in favor of a modified form of municipal ownership of street railways, and in favor of a form of compulsory arbitration in labor disputes, which would make street railway strikes impossible. The commission agrees that street railway strikes are such an interference with public business that the municipality is justified in taking steps to prevent them. While no plan was selected formally, the opinion was that all grants of franchises should have a clause providing for compulsory arbitration. The commission committed itself to municipal ownership so far as the tracks and other parts of a street railway plant actually in and a part of the street are concerned. It did not decide in favor of municipal ownership of rolling stock, power houses and other parts of the plants, and municipal operation was not considered at all.

Fourth of July Traffic and Accidents

July 4 was, according to the traffic figure kept by the street railway companies in the larger cities, a record breaking day in the number of passengers carried. Companies all over the country enjoyed a large increase in traffic, and former records for carrying passengers were broken in many cities, including Albany, Troy, Kansas City and Buffalo. The day was also eventful in the way of accidents, the worst of which occurred at Tacoma, where thirty-six persons were killed, and about sixty injured, and at Webster, Mass., where two were killed and many injured. Accidents not so grave as those mentioned above occurred at Dayton, Cincinnati, Detroit and Kansas City.

The Situation in St. Louis

The strike situation at St. Louis remains unchanged. The company is operating its cars regularly, and but for the appearance of the 'buses, run by the strikers, there is no indication that a strike is on. So far there have been very few attempts at violence. One man was killed, however, by an employee of the Transit Company,

whom he attacked on Saturday, and another was seriously injured. On July 17 the citizens' arbitration committee sent letters to President Whitaker and the directors of the company and Chairman T. S. Edwards, of the grievance committee, formally requesting that they submit the differences between the company and the strikers to arbitration.

Besides the difficulties with its employees the company has also to prepare to defend quo warranto proceedings against it by the Attorney-General, who prays for the revocation of the charters of the St. Louis Transit Company, United Railways Company and the National Railway Company, on the ground that the United Railways Company has not conformed with its charter and that it is a party to a scheme to create a street railway monopoly in St. Louis, as shown by its lease of its properties to the St. Louis Transit Company, a corporation apparently formed to assist in the formation of the alleged monopoly. The petition alleges over-capitalization and violation of the State and Federal constitutions.

Mr. Louderbach Resigns from the Lake Street and Northwestern Elevated Roads of Chicago

D. H. Louderbach resigned last week as president and director of both the Lake Street Elevated Railroad and the Northwestern Elevated Railroad, of Chicago. Howard Abel, secretary and treasurer of the Lake Street Elevated Railroad, was elected president of that company, and Harvey T. Weeks was elected to succeed him on the board. William V. Griffin succeeds Mr. Abel as secretary and treasurer of the company. Louis S. Owsley has been elected president of the Northwestern Elevated, to succeed Mr. Louderbach. Mr. Abel is considered to be well qualified to perform the duties of his new position, he having been connected with the Northwestern Elevated, the Union Elevated and many of the surface lines now embraced in the Consolidated Traction Company, and also having a prominent position in the management of the Lake Street Elevated during Mr. Louderbach's term as president. Mr. Abel is thirty-two years old. Mr. Owsley's experience began several years ago as treasurer of the West Chicago Street Railroad. He is thirty years old.

Superintendent Rounds of the Metropolitan Street Railway Resigns

Frederick D. Rounds, general superintendent of the Metropolitan Street Railway Company, and general manager of the Third Avenue Railroad Company, of New York, has resigned. Mr. Rounds' resignation is said to have been due to marital troubles, and it is announced that he will leave the city and embark on a business career elsewhere. Mr. Rounds was born in Watertown, N. Y., in 1864, and came to New York twelve years ago. He became interested in the work of the Young Men's Christian Association, and was later elected secretary of the West Side branch of that association. Later he became secretary of the Broadway & Seventh Avenue Railroad. When Mr. Vreeland was elected president of the Metropolitan Street Railway Company in 1893 he appointed Mr. Rounds as his secretary. Through perseverance and attention to duties he was gradually advanced to the position which he has just resigned. The position held by Mr. Rounds has been abolished, and the duties will hereafter be performed by Oren Root, Jr., the present assistant general manager. T. A. Delaney, who was superintendent of the Second Avenue division of the Metropolitan system, has been advanced to the newly created position of superintendent of transportation. J. J. Shea, who was Mr. Delaney's assistant, has been elected to succeed Mr. Delaney.

New York Roads to Fight the Franchise Tax Law

The railroads of New York City are preparing to fight the franchise tax law, and have secured writs of certiorari against the State Board of Tax Commissioners to review the assessments made for this year under the new law. In each case it is set up that the assessments are wholly illegal, the contention being that the franchise tax law impairs the obligations of the contracts under which the franchises were acquired and so is in contravention of the State and federal constitutions. The writs are all returnable the first Monday of October.

The Third Avenue Railroad Company was first assessed by the State Board at a valuation of \$11,886,200. On application for a correction of the assessment it was reduced to \$11,247,712. Aside from the constitutional question raised it is contended that the assessment is based on an overvaluation of \$10,483,878.

The Forty-Second Street, Manhattanville & St. Nicholas Avenue Railway Company was assessed at \$2,418,900, but the State Board reduced this on a hearing to \$2,047,149. The company says the reduced assessment is too high by \$1,577,853.

The assessment of \$2,320,000 made against the Union Railway Company (Bronx) was reduced to \$1,702,278 by the Tax Board, but the company says this an overvaluation by \$1,117,278. The Union Railway Company (Manhattan) was assessed at \$50,000, but that was reduced to \$46,000. It is urged that the reduction should be to \$5,000.

The Dry Dock, East Broadway & Battery Railroad, which got the State Board to reduce its first assessment from \$2,708,000 to \$1,378,767, wants the valuation put at \$100,000. The Southern Boulevard Railroad Company had its assessment of \$211,680 reduced to \$155,395 by the State Board. It says that this is an overvaluation of \$67,395. The Westchester Electric Railway Company was assessed \$183,320. This was lowered to \$115,800 and the road wants a further decrease to \$65,300. The Manhattan Railway tax is based on a valuation of \$46,127,000. The company asks for a reduction to \$11,720,239.

Employees of the Chicago Union Traction Company Secure an Advance in Wages

On July 10 the Chicago Union Traction Company notified the employees of its North Side lines in an official circular that after Aug. 1 they would be paid by the hour at the same rate now in force on the West Side. No employee will receive less than \$1.50 per day. The circular urges the men to stricter attention to their duties to the company and to the public. The circular follows in part:

"CHICAGO, July 10, 1900.—To the Employees of the Chicago Union Traction Company—Gentlemen: In the management of great interests like the Chicago Union Traction Company, and in order to successfully meet all the requirements of the public, it is necessary that the management and the employees thoroughly understand each other. With this object in view, it is my desire in this communication to call your attention to the many criticisms which are being passed upon your actions, principal among which are the alleged ungentlemanly treatment of passengers and general carelessness which results in accidents.

"Before taking unnecessarily harsh measures it is the desire of the management to better present conditions and also retain the employees who are now in its service; therefore I especially and most earnestly request that conductors, gripmen, motormen and all other employees so conduct themselves in every act that their conduct toward the public may be such that it will commend both the employees and the management to the entire community. In other words, an employee of this company must be a gentleman under any and all circumstances.

"In reference to accidents, I wish to say that there are conductors, gripmen and motormen who have been in the service of this company for a number of years, and have never had a serious accident, at the same time running upon streets where others meet constantly with annoying and expensive accidents, caused by lack of attention and forethought to see impending danger.

"I wish to state most emphatically that avoidable accidents must be stopped. I am of the opinion that this can be brought about without the dismissal of men, and call upon you to demonstrate, by your actions, commencing this day, that accidents may be materially reduced. If this cannot be accomplished by mild measures, the management will be forced to act more severely.

"Be gentlemanly at all times. Remember that deportment is considered in the general standing of an employee, and neatness of person and attire is as much necessary to success in the railroad business as elsewhere. Elderly persons and women with children should have assistance when getting on or off your car. Remember that in the railroad business, as well as elsewhere, gentlemanly deportment, neatness of person, and good common sense will sooner or later meet with their proper reward.

"As further evidence of the close relations existing between employer and employee, the management has concluded (at a time when no demands are being made) to pay all trainmen in the service of the Union Traction Company a uniform rate by the hour. On and after the first day of August, 1900, the employees of that part of the system known as the old North Chicago Street Railroad will, if they prefer this system of payment, receive the same rate of wages as now paid to those of the West Side lines of this company, as follows: Gripmen, 23 cents per hour; motormen, 21 cents per hour; cable grip-car conductors, 23 cents per hour; cable trailers and electric car conductors, 21 cents per hour.

Yours very truly,

J. M. ROACH,

"President and General Manager."

The Berlin Street Railway Strike

[From Our Regular German Correspondent.]

The strike which occurred recently on the lines of the Grosse Berliner Strassenbahn, though of shorter duration than that in St. Louis, seriously crippled the service of the company while it lasted. Of the 5200 employees of the company, 4800 went out. Soon after the ordering of the strike, on May 18, the former employees and their sympathizers commenced their interference with the operation of the company's cars. Numerous attempts at violence are reported and the strikers resorted to the most cowardly means to do damage to the company's property and injure its new employees. These latter soon refused to do their duties, as they were no longer certain of their lives, but as soon as operations were stopped, there were no more demonstrations by the mob. The officials of the company announced their position in a circular, which was sent to the press, and which contained the following statements:

"While the directors of the road attempted to continue the operation of the road in the best possible manner with new men the strikers endangered the lives of these men by systematic attacks, and interfered with traffic by damaging the company's property, placing stones on the tracks, and unharnessing the horses. This plainly shows that the leaders of the strike have no intention of arriving at an amicable settlement with the officers of the company, but are desirous of forcing matters to extremes by violent attacks without regard to the lives and convenience of the traveling public. The directors, on the other hand, have concluded to meet the demands of the strikers in a peaceful manner. They have promised to pay the motormen and conductors M. 90 per month when they enter their employ. These wages are gradually increased during the first ten years to M.110, and as the men continue in the company's service to M.120. This is in addition to all extra earnings, giving them their uniforms free, promising them a Christmas present, trip tickets and money in case of sickness. The questions regarding the number of working hours and division of time were also discussed with the representatives of the employees, and here again the company met the demands of the men. It should be stated in particular that each man was to get off one day in each week, and one Sunday in each month, and full pay was to be given during vacation days to all men who had served for three years."

It is to be regretted that the principal Berlin newspapers took so adverse a stand toward the company, which does not seem to be liked any too well by the general public. But this is the case with nearly every large railway company, no matter how well it tries to serve the public. The papers, for example, resented the statement of the company that the strikers used extreme measures to force the issue, and expressed the belief that the sympathizers of the strikers should be blamed for the damage inflicted. It seems certain, nevertheless, that it must have been the strikers themselves, as familiarity was shown with car construction and equipment by the way in which the cars were dismantled and the brakes, the contact switches, controllers, etc., removed. Even if the strikers did not actually do this destructive work themselves they certainly must have instructed their accomplices.

It may further be remarked that the police were very slow in making their appearance and protecting life and property. In one of the conferences held between the police commissioners and the directors of the company, in the presence of a member of the imperial railway ministry, to discuss the question whether the company had done everything in its power to avert the strike, and what might be expected from a large railway company, it was decided in the affirmative, and the concessions made by the company were deemed sufficient, such as the payment of 40 pf. per hour overtime, instead of 25 pf., as heretofore, and this was increased to 50 pf. per hour by the directors, thus doubling the former rate.

The magistrate also had a conference with the city's traffic association to discuss the question of the pensioning of old, incapacitated street railway employees. The company, it should be stated, is about to establish a pension fund for all its employees, to which the latter and the directors contribute equally. The employees have their dues deducted from their monthly salaries, while the directors contribute their share at the end of the fiscal year. The question at issue now is as to who is to decide when an employee is entitled to a pension on account of disability. The directors claim this right for themselves, while the employees assert that they should have a right to share in this decision, because they contribute equal dues. The magistrate agreed with the employees, and this latest demand has been submitted to the company, namely, that the board of trustees of the pension fund shall be composed of delegates chosen by the employees and by the directors, who shall decide the question of eligibility to a pension.

The strikers chose this time for making their demands, as they

knew the density of the traffic during the pfingst holidays, and the loss a strike would mean to the company during that time.

On Sunday, May 20, traffic was resumed with sixty cars, and was continued on seven main lines, until 7 p. m. The employees consisted of men who had stood by the company, and new hands which applied in very large numbers. Each motorman was accompanied by a guard, and ample preparations had been made by the police to avert any violence on the part of the strikers. The latter left Berlin during the early morning hours, and assembled in the suburban towns.

The demands of the strikers were as follows: Conductors and motormen to start with wages of M.90 a month, which is to be increased M.5 each year until a maximum of M.130 is reached, that is after eight years of service. A working day to consist of nine hours for motormen, of which only eight and one-quarter should be working hours, there being one or two periods of rest, three-quarters of an hour in length. No trip should take longer than one and one-half hours, and after each trip there should be a rest of at least twelve minutes at the terminal points. Should the men demand extra pay on Sundays or other days with heavy traffic, the rate shall be 60 pf. per hour. The conductors demand ten working hours and the same maximum hours and other conditions asked for by the motormen. The latter shall be permitted to draw mileage (trip money) as they did formerly, which amounts to about M.15 each month, while the conductors shall be permitted to receive tips. Conductors and motormen are to receive ten days vacation each year, and one day off duty each week, which must be a Sunday once every four weeks. All these "off" days shall be paid for in full. They further demand that a married man must be notified three months in advance if he is to be transferred to another territory, and a single man four weeks in advance. This is demanded because formerly it was often necessary for a man, who had been transferred to a distant portion of the system, to travel an hour or more before he reached his home. The men base their claims for higher wages and shorter hours on the fact that the introduction of electricity demands greater care and attention on the part of the employees, and that the motormen are in constant danger of being imprisoned, the penalty in Germany for a collision. For that reason the motormen are steadfast in their demands. In addition to the above danger they claim that their health and lives are imperiled frequently on account of the reckless driving of coachmen and the high speed of the cars.

This recklessness on the part of the Berlin drivers is evidenced very clearly in the official report of the Traffic Commissioner for 1898. According to these statistics 2517 accidents to persons are due to horse and electric cars, seven of which were fatal, 145 serious and 1048 slight injuries. The omnibus service is responsible for 163 accidents, seven fatal, forty-two serious and seventy-six slight injuries. Other vehicles, such as butcher and beer wagons, caused 2996 accidents, forty-two of which were fatal, 463 serious and 1559 slight injuries. One thousand and ten accidents are due to bicycling, of which two were fatal cases, thirty-eight serious and 497 slight injuries. A total of sixty-six persons were killed in these ways in 1898, and in 1899 seventy-six persons. It must not be forgotten that the streets are wide and well paved, while in other large cities, such as London, Paris, Vienna, etc., the drivers are frequently handicapped. Many attempts have been made to remedy this evil, and it has lately been proposed by Mr. von Ploetz to establish a training school for drivers, which should be supported by the city, and where each newcomer must satisfy the police department that he is capable of managing his team before he is permitted to appear on a seat of a conveyance in the streets of Berlin.

On Monday, May 21, the service was continued in the same manner as on Sunday. On Friday, Saturday and Sunday the strikers had held meetings which were attended by 4000 men, and it was decided to ask the Mayor of Berlin, Mr. Kirschner, to act as arbitrator. The latter accepted the office, and advised the men to go to the directors of the road and ask them to sanction their selection. This was agreed to, and a meeting was held at the City Hall, which lasted until 4:30 p. m. An agreement was finally reached, and the strike was declared off, the following conditions having to be fulfilled:

The pension fund is to be managed by a board consisting of delegates chosen by the employees and directors. The salaries of the motormen and conductors at the beginning to be M.85, after a six months trial M.90, after three years' service M.95, after ten years' service M.100, after fifteen years M.115, and after twenty years M.120. The employees are to get four days off duty each month, and every seventh day must be a Sunday. The maximum number of hours for conductors is eleven, for motormen nine. Overtime is to be paid for at the rate of 50 pf. per hour. At each depot there will be representatives of the men, who will look after the welfare of the employees and settle any differences which may arise between them and the officials of the company. All these

agreements were ratified by the strikers, and the strike was declared at an end at 3:30 p. m.

As the general public evinced great sympathy with the strikers at the beginning of the disturbance, without having any knowledge of the income of the men and the prevalent conditions, as well as the new arrangements entered into by the employees and the company, it might be well to point out by actual figures how great an influence the moneys paid to employees have on the profits of, and therefore the dividends paid by, the company. The desire for more wages is becoming epidemic throughout Germany, and for that reason this question is one of particular interest and importance.

In looking over the 1899 report of the company we find the following items in the chapter dealing with salaries: Five thousand three hundred and fifty-seven persons were employed, against 5014 in 1898. The increase of 343 persons is due to the extensions of the electric roads.

1. The wages of these 5357 employees during 1899.....	M.5,136,908
2. For work on extensions, including the care of depots, roads, maintenance of horses and wagons, etc.	913,455
3. Payment for living quarters for watchmen and depot master	11,325
4. Uniforms supplied free to the men and their repairs	223,469
5. For sick and disabled employees.....	42,555
(To sick persons the sick fund pays two-thirds of their salary, and if they have been in the service of the company for three years, the latter adds the other third; this amounted to 38,000 marks, which is included in the above item.)	
6. At the general meeting there was allowed for aid to employees.....	50,000
7. The company paid into the sick fund.....	45,200
8. The company paid into the treasury of the accident insurance company for the benefit of the employees.	29,000
9. For insurance of old and crippled employees.....	41,000

TotalM.6,493,307

This gives an average income for each man of M.1212.11 or M.101 each month, which cannot be considered as insufficient or starvation wages, in view of German conditions. Besides their wages, the conductors, and to a lesser degree, the motormen, have a small income in the way of tips, which ought not to be omitted from consideration simply because it does not come from the company. The latter could easily charge from 5 to 10 pf. for each basket or package if it would so elect, instead of permitting the conductors to pocket such fees. It is difficult, however, to estimate this income because the employees are apt to underestimate it when asked for a report. It might be fair to assume that each tenth passenger gives the conductor a 5-pf. tip. In 1899, 180,000,000 persons were carried on the lines of the Grosse Berliner Strassenbahn; a tenth of this would give 18,000,000 5-pf. pieces, or M.900,000. This is divided among the 1688 conductors, who give some to the nineteen chief conductors and 1558 motormen, a total of 3265. This would give each man M.275.65, which, added to the above average of M.1212.11, gives a total yearly income of M.1487.76. The beginners, of course, have less income, but in time it reaches this sum. Thousands and tens of thousands of Berlin workmen have less income than this, and many of those who do receive it do not have steady work,—surely not a life job, as is that of the railway employees. It is hard, therefore, to find a real cause for striking, but let us look at the new conditions.

The wages at the beginning have been increased from M.80 to M.85; after six months this is raised to M.90, etc., as stated before, until a maximum of M.120 is reached after twenty years' service. The former maximum was M.100 per month. The switchmen, roadmen, car cleaners, stablemen, etc., receive M.3, and after some service M.4 per day. The "Kilometer money" of 50 pf. per day for electric and 35 pf. for horse service remain as before. Hours utilized for instructing the men are reckoned as overtime. Any employee pressed into military service for practice work will receive full pay.

The increased cost of the service to the company over what formerly obtained, consists of:

1. The increase of wages of from M.5 to M.20.
2. The shortening of the working day by two hours. This necessitates an increase of the force.
3. The establishment of the pension fund. This expense will probably not be less than M.50,000 each year to the company; in 1899 claims amounting to M.100,000 were submitted.

Summing these items up, we find that the salary increase for 3265 men amounts to M.489,750 each year. Adding to this an increase of M.30,000 for the other employees, there is a total in-

crease of about M.520,000 in wages account. The shortening of hours will probably mean a 10 per cent increase in the number of men employed, or about 400 men, at M 1600 a year, making a total of M.640,000. The amount paid into the pension fund might be estimated at M.50,000 per year.

These three items give a yearly increase of M.1,010,000. The company's estimate was about M.1,000,000, showing the above calculation to be about correct.

The company's balance sheet showed a profit to be divided among stockholders of M.4,646,250, or for 44,250,000 shares, a dividend of 10.5 per cent. Subtracting from this the million mark increase in salary, there will be M.3,646,250 to be divided next year.

But in addition to this, the city, in lieu of extending the franchise until 1945, has asked for additional payment from the company. In 1899 the latter paid M.1,656,434, but in the future M.2,000,000 will hardly be sufficient. It is possible that the increased traffic and the cheaper electric service will more than make up for this increase, though this seems doubtful. Besides, the capital was increased last November by M.22,875,000, so that the profits must be divided among M.67,125,000 instead of M.44,250,000. The above M.3,646,250 would thus only produce a 5.43 per cent, instead of a 10.5 per cent, dividend. In fact, large dividends are a thing of the past; from 1890-1895 a dividend of 12.5 per cent was paid, then 15 to 16 and 18 per cent. In 1899 it was 10.5, the lowest in the entire decade. The stockholders have therefore lost over 100 per cent on the exchange, as the shares were formerly worth between 300 and 400, and now are only rated at 227. It is to be hoped, however, that if electricity is introduced on the entire road the showing will be much improved.

On the whole, it may be said that the company easily controlled the strike situation, as cars were run nearly uninterruptedly during the day time, and 22,000 persons applied for work under the old conditions. The victory, however, also is a significant one for the "Social-democracy," which is responsible for the strike. The 4000 employees have now formed an association which is in the hands of social-democratic leaders, and each man pays for social-democratic purposes 20 pf. per week, or a total for all the men of M.41,600 per year. This may be termed the campaign fund for the next strike.

The success of the Berlin strikers has caused the employees of the Hanover, Cologne and Copenhagen street railway companies to demand higher wages. The Hamburg company had already promised its conductors an increase on April 1, which was a most fortunate circumstance and is probably responsible for the fact that Hamburg, where conditions are similar to those in Berlin, is the only large German city where no strike has taken place. Never before, however, has it been so clearly shown as by this strike how incapable the police force in German cities is to

Test of the Power Plant of the Buffalo Street Railway*

R. C. CARPENTER AND H. J. RYAN

The power plant of the Buffalo Street Railway was tested the latter part of the last term by the department of experimental engineering. The test was made at the request of R. E. Danforth, the superintendent of the Buffalo Railway Company, to ascertain the economy of the station when operating under various conditions. On account of the character of the power available at Buffalo, the test is one of peculiar interest. A large portion of the power is obtained from a steam plant, and a minor part from the water power at Niagara Falls. A storage battery of 272 cells 3000 amp.-hour capacity is also employed to absorb current during the time when the capacity is in excess of the demand and to give out current when the reverse condition exists.

While the plant is not larger in aggregate horse power than others which have been tested at various times by students in the course in mechanical and electrical engineering, yet on account of the number of units and the varied character of the apparatus employed, it required more apparatus and more help to successfully conduct the test than any before undertaken in connection with the Sibley College work.

In order to test the plant under various conditions of operation, it was necessary to operate it continuously for ninety-six hours. This condition made it necessary to have two shifts of observers. In all somewhat over ninety men from the junior and senior classes took part in the various tests as assistants and observers.

In the organization of the test, Professor Carpenter assisted by Professor C. R. Jones and Austin Burt had charge of the mechanical test, including boilers, engines and pumps, and Profes-

* From the *Sibley Journal of Engineering*.

sor Ryan, assisted by E. L. West and G. S. Macomber had charge of the electrical portion of the test. For the purpose of working up results and putting the records of the test in form, the work was divided into three sections and assigned to the following members of the senior class for these.

1. The boiler section, J. J. Cuyle and L. Morgan.
2. The engine section, Austin Burt, J. V. McAdam, A. Englert, S. E. Smith, C. B. Holden, W. C. Dalzell.
3. The electrical section, G. S. Macomber, Charles R. Scott, R. H. Dearborn, J. M. Gilchrist, G. B. Woodhull, W. L. Cook, J. E. Hess.

The editing of all the mechanical and electrical results was undertaken by Mr. Burt and Mr. Macomber. The other gentlemen devoted their time to the detailed description of special features of the plant and to a discussion of the results.

A considerable portion of this abstract is taken directly from the thesis of Messrs. Macomber and Burt.

OUTLINE OF THE TEST

Equipment—The system of the Buffalo Railway Company is operated under three conditions of power distribution as follows:

1. By steam, operating 10 units, three 1000-hp vertical cross-compound D. C. engines, six 500-hp vertical cross-compound belted engines, one 250-hp horizontal cross-compound Ball engine belted.
2. By Niagara Falls power operating four 500-hp rotary converters.
3. By storage battery operating through a booster.

OBJECT OF THE TEST

The object of the test was to determine the following:

1. The relative value of the three conditions of operation.
2. The economy of the boiler plant.
3. The economy of the engines.
4. The economy of the electrical equipment.
5. The various factors in the operation of the entire plant.

The first it was proposed to accomplish by making three twenty-four-hour runs as follows:

- a. Under normal conditions as operated every day, *i. e.*, with full quota of Niagara power, with as many engines as the load required, and with battery in normal service.
- b. Eliminating Niagara Falls power and operating with engines and battery alone.
- c. Eliminating the battery, operating with engines and Niagara power only.

The second was to be determined by a complete boiler test.

The third, by a complete engine test.

The fourth, by a thorough test of the electrical equipment.

The fifth, to be deduced from the results of the other tests.

The Test as Actually Carried Out—Everything was in readiness and the signal to start the test was given promptly at 11:00 o'clock a. m., Feb. 28, 1900. All went well until about 5:30 p. m., when an unexpected disturbance occurred just at the peak of the load. Owing to the disturbing influence thus introduced it was decided to call this run a preliminary one and make another normal run.

The actual test runs were as follows:

- Run "2." Operating under normal conditions.
- Run "3." Eliminating Niagara power.
- Run "4." Eliminating the battery.

Everything ran along smoothly to the end of the test in spite of the fact that a terrific snow and wind storm prevailed for the greater part of the first three days.

It is a matter for which Sibley College should be congratulated that the largest test, of this character, in the history of engineering was so successfully completed without a single accident, either to the ninety students conducting it or to the valuable machinery so generously placed at their disposal.

The Boiler Plant.—The boiler plant consists of eighteen boilers, two of which are of the Scotch marine type, the remainder are water-tube boilers built by Babcock & Wilcox. The boilers are all set over Roney automatic stokers and are supplied with coal from a traveling car mounted on overhead track. The total boiler horse power has a rated capacity of 5080. The general results of the boiler test are shown in the following tables, each run being twenty-four hours in length:

PRESSURE				
	Run 1	Run 2	Run 3	Run 4
Barometer, inches mercury	29.13	28.73	29.08	29.40
Steam gage, pounds	127.5	128.4	128.8	128.7
Absolute steam pressure, lbs.	141.75	142.53	143.05	143.1
Draught gage, near damper, inches water.	B 67 C.74	B.75 C.65	B.78 C.61	B 75 C.60
TEMPERATURE.				
	Run 1	Run 2	Run 3	Run 4
External air, degrees F.	25	22	22.4	26
Boiler room	90	90	90	90
Escaping gases,	351 603	333 583	429 608	332 576
Furnace,	2500	2500	2500	2500
Feed water,	179.5	180	179	171
Steam,	353.7	351.2	354.4	355.5

Kind of coal	Fuel			
	Run 1	Run 2	Run 3	Run 4
Locality				
Size of coal				
Fixed carbon, per cent.	59.39			
Volatile moisture,	31.75			
Moisture,	1.1			
Ash,	7.76			
B. T. U. per pound coal	12800			
Total coal consumed, pounds	302,742	245,351	354,886	192,262
Total refuse, dry,	32,800	30,655	43,393	27,871
Total refuse, dry, per cent.	10.8	12.5	12.3	14.5
Quality of steam,	98.66	96.4	98.45	98.3
TOTAL WATER.				
	Run 1	Run 2	Run 3	Run 4
Total wt. water used, pounds	2437,492	1845,184	2742,450	1449,950
Equiv. evap. from and at 212°	2639,824	1974,433	2954,917	1573,345
ECONOMIC EVAPORATION, PER POUND OF FUEL				
	Run 1	Run 2	Run 3	Run 4
Actual, per lb. dry coal, lbs.	8	7.5	7.7	7.5
Equiv. from and at 212° [dry coal] lbs.	8.6	8	8.3	8.2
Heat generated per lb. coal	8394	7773	8044	8170
Efficiency of boiler and grate	65.5	61.	62.7	64
Per cent. coal saved by heaters	7.4	8.3	7.2	7.3
Average boiler hp	3178	2410	3570	1900
Max. " " " "	3410	5-6 p. m.	9-10 p. m.	6-8 p. m.
Rated " " " "	4340			4060
Feed water from tanks, per cent.	88.6	86.1	88.8	86
" " car house drips	0.62	1.0	0.68	1.3
" " low pres.	9.6	10.7	9.34	9.1
" " high " "	1.18	2.2	1.18	3.6
Steam delivered to engines	94	92	93.5	90
" " for heating buildings.	1.5	2.3	1.5	3

THE ENGINE SECTION

The engines are numbered consecutively from 2 to 11, as shown by the table. A complete description of the details of the engines may be found in the thesis of Messrs. McAdam and Scott.

The Indicators.—There were thirty-eight indicators in use on the test, four on each engine with the exception of No. 3, which was provided with three-way cocks, and, therefore, with only two indicators. They were for the most part in excellent condition and stood the long strain remarkably well. The reducing motion was of the lever brumbo type and was carefully overhauled and put in good condition for each engine.

The Indicator Cards.—Metallic cards were used exclusively. In all 7344 cards were taken. Sample cards from each engine taken at 6 p. m., March 3, are shown in the thesis of Burt and Macomber.

IHP Data and Results.—The cards were all carefully integrated, computed and checked, and they are tabulated in the Burt-Macomber thesis. A comparative column of ehp with the combined engine and generator efficiency is shown in the same tables.

Table of Averages.—In this table are shown, in the Burt and Macomber thesis, the ihp, ehp, efficiency and r. p. m. averages for each run, together with the actual time the engines are in operation and the total energy in hp-hours developed by each engine.

Table of Totals.—In this table are shown, in the same thesis, the grand total for the three runs.

Table of Summaries.—In this table the average total ihp is derived by dividing the total energy of all of the engines developed by the time the engines are in operation. The total for water evaporated includes the steam used by the auxiliary machinery, but not that used by the heating system, etc.

The Characteristic Curves.—These are shown in the same thesis, and include the actual ihp for each engine and the grand totals.

The Engine Log.—Readings were taken every fifteen minutes, the signals being given as follows:

- Three signals—Two minutes before time, to take the r. p. m.
- Two signals—One-half minute before time, to get ready.
- One signal—On time to take cards and electrical readings.

The electrical machinery of this plant includes seven 200-kw Edison; six 250-kw Thomson-Houston, and three 800-kw General Electric generators; four 500 kw 25-cycle G. E. rotaries receiving current from Niagara Falls; a 272-cell, 3000 amp.-hour battery capable of being discharged in one hour; and a 3000-amp., 70-volt battery booster, compound wound and motor driven in such a manner as to compensate automatically for the drop due to the internal resistance of the battery causing it to take the station load fluctuations. The normal station bus-bar pressure is 550 volts.

Necessary electrical readings were made to secure the following facts relating to the operation of this power plant:

- (1) The load factor of the station, *i. e.*, the ratio of the mean average load for twenty-four hours to the maximum average output, not including fluctuations.
- (2) The per centage of variation above and below the average during times of maximum and minimum load on the station, making note at the same time of the probable number of cars in operation from the station.
- (3) A daily output curve showing the charge and discharge of the batteries in comparison with the output of the station.

(4) The efficiency of the storage battery, that is, the per centage of energy delivered to the battery in twenty-four hours that is usefully returned.

(5) Regulating curve of the batteries, that is, the voltage during charge and discharge with various currents.

(6) The probable saving in coal consumption due to steadier

DIMENSIONS OF ENGINES

Type of Engines	ENG. No. 2		ENG'S NOS. 5, 8, 9, 10, 11, 4		ENG'S NOS. 6, 7		ENG. No. 3	
	Ball Horz. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.	L.E.E.Wks. Vert. Cr. Comp.
Nominal hp.	250	500	1000	1050				
Nominal r. p. m.	225	135	102	100				
Hp cyl.	Dia. 13"	17"	22"	22"				
Lp cyl.	Dia. 22"	33"	44"	46"				
Stroke	l 16"	28"	36"	35"				
Hp piston rod.	Dia. 2"	3.5"	4.75"	4.75"				
	Area 3.14	9.62	17.73	17.73				
Lp piston rod.	Dia. 2.5"	3.5"	4.75"	4.75"				
	Area 4.91	9.62	17.73	17.73				
Hp piston, a = Head end	Area 132.73	220.98	380.13	380.13				
Hp piston, a' = Crank end	Area 129.50	217.36	362.40	362.40				
Lp piston, a = Head end	Area 380.13	855.30	1520.5	1661.9				
Lp piston, a' = Crank end	Area 375.22	845.68	1502.8	1649.2				
Lp piston, both ends	Area 755.35	1700.98	3023.3	3306.1				
Hp piston, both ends	Area 262.32	444.34	742.53	742.53				
Eng. Factor, K = l $\frac{a + a'}{2 \times 33000}$	Hp .005290	.01571	.03375	.03375				
	Lp .01536	.06014	1.374	1.503				

* L. E. E. signifies Lake Erie Engine

SUMMARY OF RESULTS OF ENGINE TEST

	Run 2	Run 3	Run 4
	Normal	Without Niagara	Without Battery
Total energy developed by engines: hp-hours	65566	107174	52972
Total time engines are in operation: hours	19.95	24.0	18.16
Average total ihp on basis of actual time	3486.9	4465.6	2917.0
Average total ihp on basis of twenty-four hours	2898.9	4465.6	2307.1
Total water evaporated for power only: pounds	1730424.	3612937	1366524
Pounds of steam per ihp per hour, auxiliaries included	24.88	24.88	25.79
Total coal consumed: pounds	245351	354836	192262
Pounds coal per ihp per hour	3.58	3.31	3.64

ENGINE	AVERAGE IHP			AVERAGE EHP			AVERAGE MECHANICAL EFFICIENCY			
	Run 2	Run 3	Run 4	Run 2	Run 3	Run 4	Run 2	Run 3	Run 4	
Direct Connected	3	978.2	1050.5	915.3	914.0	1008.4	853.7	93.5	95.9	98.2
	6	960.9	999.7	841.6	838.1	856.1	749.3	87.1	85.9	88.7
	7	978.9	1003.0	896.4	813.9	835.3	758.1	83.3	83.3	84.1
		2018.0	3053.2	2650.2	2566.0	2699.8	2361.1	87.9	88.4	87.3
Multi-Polar	5	474.6	464.5	466.6	410.6	396.3	375.7	86.6	85.5	84.2
	8	539.5	527.1	517.9	472.8	450.2	446.1	87.0	85.4	86.2
	9	476.6	507.0	516.9	377.7	408.5	410.5	80.6	80.8	79.5
		1500.7	1498.6	1501.4	1261.1	1255.0	1232.3	83.7	83.9	83.3
Old Bi-Polar	10	429.3	463.9	513.1	364.3	397.2	406.6	85.3	84.6	80.0
	11	517.9	507.4	471.6	440.9	450.1	390.3	85.3	88.6	80.7
	4	302.1	470.9	404.3	302.7	362.4	285.4	74.9	77.3	70.9
	2	-----	226.0	301.0	-----	171.4	235.0	-----	66.0	75.8
		1339.3	1668.2	1690.0	1107.9	1381.1	1317.3	81.8	79.1	76.8
	5 58.0	6220.0	5841.7	4935.0	5335.9	4910.7	84.1	83.7	84.2	

ENGINE	AVERAGE R. P. M.			TIME IN SERVICE—HOURS			ENERGY OF ENGINE—HP-HOURS			
	Run 2	Run 3	Run 4	Run 2	Run 3	Run 4	Run 2	Run 3	Run 4	
Direct Connected	3	102.8	101.3	102.7	18.87	24.00	14.48	18,438	25,212	13,253
	6	102.3	100.4	105.1	17.05	15.83	16.57	16,384	15,824	13,946
	7	103.1	96.7	106.5	12.98	19.82	12.55	12,706	12,706	11,212
		-----	-----	-----	48.90	59.65	43.60	47,548	60,917	38,411
Multi-Polar	5	132.1	131.2	132.0	11.82	12.90	6.85	5,609	5,991	3,059
	8	136.2	135.7	135.5	6.27	17.57	5.07	3,383	9,261	2,626
	9	133.7	133.0	134.2	3.98	17.12	4.05	1,865	8,680	2,094
		-----	-----	-----	22.07	47.59	15.97	10,857	23,932	7,779
Old Bi-Polar	10	138.8	137.1	137.3	3.82	12.46	1.52	1,640	5,776	780
	11	140.5	139.0	140.0	13.45	16.68	6.78	6,965	8,463	3,198
	4	141.5	142.0	142.9	6.52	15.55	6.23	2,556	7,322	2,539
	2	-----	226.5	225.0	-----	3.88	.88	-----	764	265
		-----	-----	-----	23.79	48.06	15.46	11,161	22,325	6,782
Total	-----	-----	-----	94.76	155.30	75.03	60,566	107,174	52,972	

load obtained by the use of the battery, and the extent to which the battery permits operation of the station with less capacity in generating units than if it were not used.

The output in current and bus-bar pressure of each generator and rotary, and the input of the battery booster were observed each quarter hour on signal at the same moment that the indicator cards were being taken. The battery current was under constant observation; the average current was charted every twenty seconds. The battery pressure was read every five minutes.

The following electric instruments and apparatus belonging to the Sibley College were used in making the above readings and for calibrating available instruments that belong to the power plant:

- 2 Weston voltmeters, range, 600 volts.
- 12 Weston millivoltmeters, range, .06 volts.
- 3 Weston mangain shunts, range, 2,000 amps.
- 5 " " " " " 1,000 "
- 13 " " " " " 500 "

A large number of cast copper connections which were machined to fit the shunt blocks and to connect them to the machinery terminals.

Three sets of No. 10 B. & S. G. 12-ft. connecting wires, and double throw switches for using one millivoltmeter on either of two machines, in three instances.

The voltmeters and millivoltmeters were calibrated in the department of electrical engineering in Sibley College by comparison with a set of Carhart-Clark standard cells. These comparisons were made by means of a fine Nalder potentiometer and a steady pressure that is furnished over a range of 150 volts by an open circuit battery of 120 cells of the "Badt-Hermetic" type.

The resistances of the shunt blocks were determined by comparing them with a 1000 amp. .0001 ohm Board of Trade standard and a 500-amp. .001 ohm Reichsanstalt standard. The comparisons were made by passing currents from 250 to 1000 amps. through the shunts and reading the falls of potential produced, by means of the millimeters calibrated in the above manner. The current constant for any millivoltmeter combined with any shunt is then quickly determined. Since it is merely necessary to divide the volts per scale division on the millivoltmeter by the resistance of the shunt block and the result will be the constant of the instrument in amperes per division.

In this manner the electrical instruments were calibrated in terms of international volts and amperes with an absolute error not greater than one-fifth of 1 per cent.

The instruments from which the output of the rotaries, the input of the booster motor and the battery current were read belonged to the power plant. These were carefully calibrated by comparison with the Sibley College electrical instruments.

The battery ammeter was of the large Weston illuminated dial, plus and minus scale, pattern. Two observers devoted all their time while on duty to the observation of this instrument. One watched the pointer constantly, and at the end of each twenty second period called out the average value of the current during the third of a minute just past; his colleague charted this reading immediately and gave him the necessary time signals. This was very trying work. The young men were assigned to this duty

for but two hours at a time. The behavior of the battery was thus observed continuously for seventy-two hours.

The results of this test were computed and charted by the following men in the production of their theses: R. H. Dearborn, A. B.; J. M. Gilchrist, C. R. Scott, J. E. Hess, W. L. Cook, C. E.; G. B. Woodhull.

The books that contain the calibration records, and the figures and battery charts constituting the original readings are on file in the department of electrical engineering.

The following tables give the more important results that have thus far been deduced:

ELECTRICAL SUMMARY

Day of 24 Hours	Engine Indicated Hp-hours	Generator Output Hp-hours	BATTERY HP-HOURS		Rotaries Output Hp-Hours	Total Output E. Hp-Hours Without Rotaries
			Charge	Discharge		
1	-----	79,410	7,225	1,487	30,630	73,672
2	69,900	61,300	5,350	1,950	37,500	59,900
3	107,700	92,600	6,100	1 500	-----	88,000
4	53,250	46,600	-----	-----	31,100	46,000

The battery efficiency is not to be determined by taking the ratio of the above discharge to charge hp-hours. An efficiency thus determined would be very unfair for the reason that the above values do not include charges and discharges that occurred within quarter hour periods. These figures do not include momentary charge and discharge energies that occur through the load—regulating duty that the battery performs. The charging values include all the losses incurred through such process and the energy stored for greater periods than one-quarter of an hour. The discharging values include only those discharges of energy that were retained by the battery for one-quarter of an hour or more. To find from these battery values the battery loss incurred in having it carry the momentary station fluctuations, the discharge hp hours must be divided by the ordinary battery efficiency, say .75, and the result subtracted from the corresponding hp hours. The result will give the hp hours lost in the battery in taking care of the station fluctuations. Owing to the fact that a battery will carry over energy from one charge to another even when discharged to the same pressure each time it is necessary to determine this regulating cost as an average for the three days during which the battery was under observation.

Total charging hp hours.....18,675

Total discharging hp hours..... 4.937

Average battery regulating cost per day,

$$18,675 - \frac{(4937 \div .75)}{3} = 4035 \text{ hp hours.}$$

FUEL CONSUMPTION

Day	Output Elec Hp-Hours Generated. Does not Include Rotaries	Water From and at 212° in lbs. per Elec. Hp-Hour	Coal, Dry, in lbs. per Hp-Hour	Remarks
1	73,672	35.7	4.11	Battery and rotary used
2	57,900	34.1	4.23	Battery and rotary used
3	88,000	33.5	4.04	Battery only used
4	46,000	34.2	4.17	Battery not used

The table above shows only a portion of the saving which is produced by the storage battery. During the entire twenty-four hours, current at the rate of 2000 hp is supplied continuously from Niagara Falls and charged to the railroad company. This current would only in part be utilized during the time when the engines were slightly loaded, as for instance during the period after midnight. The results of test show that the storage battery receives from the Falls power, when the engines are not in use, current sufficient in the aggregate for 3000 hp-hours.* During the operation of the plant the load factor on the engine plant is kept high by stopping any engine just as soon as any evidence of a light load on the station is shown. There are a great number of cars in operation on the various railroad lines, so that the load fluctuations are light, making this practice feasible. This practice insures that under normal working conditions the engines are not operated for any appreciable time with a light load; on the contrary, each is worked within such load limits as to produce little variation in economy. For these reasons the above test cannot be considered as showing what saving might be effected in any station in which the load on the engines has an extreme and wide variation. By comparing the results of the tests on the third and fourth days, which were exactly similar except for the fact that the battery was

* During the period of the test there was a heavy snow fall, making a large night load, which reduced the usual saving due to this cause to 1600-hp, hours.

in use on the third day in connection with the engines, and the engine plant only on the fourth day, it will be noticed that the saving due to use of battery is about 4 per cent. The effect of the battery in preventing fluctuations of the load of small amount and short duration, was quite marked, and aside from the slight saving due to its use, there is doubtless a further saving because of steady load and less repairs to engines.

There are many items of interest in the results obtained from this test that can not be given at this date owing to the large amount of labor involved in their deduction.

Street Railway Patents

[This department is conducted by W. A. Rosenbaum, patent attorney, 177 Times Building, New York.]

UNITED STATES PATENTS ISSUED JULY 10, 1900.

653,218. Motor Controller; D. H. Darrin, Cranford, N. J. App. filed Sept. 2, 1899. With this controller the motor can be stopped at any point short of full speed by breaking the circuit through the manipulation of an extra circuit closer on the handle of the controller and without the necessity of moving the controller handle back to the starting position.

653,316. Trolley; W. H. Russell, Watertown, N. Y. App. filed Nov. 23, 1899. The flanges and tread of the wheel are of hard metal, while the hub, which is not subjected to wear, is of softer metal, the flanges and tread being removable from the limb.

653,402. Safety Trolley; J. W. Richmond, Fishkill-on-the-Hudson, N. Y. App. filed March 28, 1900. Details.

653,441. Grip Mechanism for Cable Railways; J. Craig, Jr., New York, N. Y. App. filed Aug. 4, 1898. This invention relates to that class of grips which are provided with ejectors by which the cable is thrown out of the jaws of the grip, the improvements consisting in certain details of construction.

653,443. Car Brake; R. W. Ennis, Buffalo, New York. App. filed Dec. 27, 1899. Power is applied to the brake shoe from the axle, a clutch being thrown in by the hand lever.

653,522. Car Truck Bearing; F. R. Northan, Chicago, Ill. App. filed Feb. 12, 1900. The object is to provide means for raising the car body to allow for sagging. This is done by making the bearing plate on the truck concave, and that on the body convex, and inserting a concave-convex plate between the two bearings.

653,532. Fastening for Rail Joints; F. W. Schinell, Portland, Ore. App. filed Dec. 12, 1899. To dispense with nuts in the fastening of fish-plates, the bolts are passed through button-hole slots in the fish-plates.

653,549. Electric Trolley; T. Derrick, Lansingburg, N. Y. App. filed Jan. 27, 1900. Details of a ball bearing.

653,565. Rail Joint; B. O. Ward, of Oak Park, Ill. App. filed Jan. 26, 1900. One of the fish-plates is U-shaped in cross section, and a flange projecting upward from the chair plate rests against it, and is held thereto by bolts, which clamp the parts sufficiently to afford a spring pressure on the nuts.

653,604. Metallic Cross Tie; J. Q. Adams, Manchester, Vt. App. filed March 17, 1900. The tie, at the point where the rail rests upon it, is provided with a socket in which is placed a spring on which the rail rests.

653,634. Apparatus for Automatically Applying Car Brakes; S. F. Woodruff, Clippergap, Cal. App. filed Nov. 11, 1899. A portion of the train pipe is placed within the range of a shearing knife, which cuts it off and allows the air to escape in case the truck runs off the track. The escape of air effects the application of brakes.

11,840. (Reissue.) Contact System for Electric Railways; W. Grunow, Jr., Bridgeport, Conn. App. filed May 29, 1900. This invention covers improvements on prior patent, No. 586,845, and relates particularly to the mounting of an electromagnet which moves bodily when energized to complete the circuit to the working conductor, the current passing through the core of the magnet.

11,841. (Reissue.) Traveling Cable Grip; E. I. Parsons, San Francisco, Cal. App. filed Jan. 30, 1900. The movable jaw of the grip is a nut in which a screw works, the threads of the screw being made rapid, so that a short movement of the crank will set up the jaw.

PERSONAL MENTION

MR. N. E. MORTON, superintendent of the Lawrence division of the Lowell, Lawrence & Haverhill Street Railway Company, of Lowell, Mass., has resigned that office.

MR. D. L. LAVENBERG, formerly chief train dispatcher for the Wheeling & Lake Erie Railroad, has been appointed chief

train dispatcher for the Toledo, Fremont & Norwalk Electric Railway.

MR. J. B. HOGARTH has been appointed auditor of the Denver City Tramway Company. Mr. Hogarth was formerly chief clerk and auditor of the Florence & Cripple Creek Railroad. Mr. Hogarth's fellow-employees on the Florence & Cripple Creek Railroad presented him with a handsome umbrella on his departure.

NEWS NOTES

[News notes for this department are solicited.]

LOS ANGELES, CAL.—The rate war between the Los Angeles Pacific Electric Railway, the Santa Fe and the Southern Pacific to Santa Monica is on in earnest. There is every indication of a big cut in rates in the near future. The electric railway has thus far met the cuts made by the steam roads, and seems to enjoy a large part of the traffic.

BRIDGEPORT, CONN.—Two companies were organized at the offices of Marsh, Merwin & Lemmon, July 12, which, for the near future, at any rate, will be intimately associated with one another. The companies are the Moodus & East Hampton Railway Company and the Mutual Construction Company. The former company was organized for the purpose of building an electric railway to connect East Hampton and Moodus. It will be incorporated under the laws of Connecticut, and the following officers have been elected: F. C. Fowler, of Moodus, president; Clifton J. Harvey, treasurer, and E. C. Crocker, of Bridgeport, secretary; board of directors, F. C. Fowler, Charles E. Brownell, Mr. Chaffee, Clifton J. Harvey, E. C. Crocker, William Markham, E. S. Boyd, A. D. Warner and William A. Redden. The company is capitalized at \$150,000, all of which has been subscribed. Of this \$150,000 has been paid in. Plans for the work of constructing the road have already been made, and work upon it will be started as soon as the act of incorporation has been passed. All work will be under the supervision of Mr. Crocker, the electrical engineer. As the plans now stand, four gangs, combining about 400 men, will be put to work on four different sections of the road. The Mutual Construction Company will engage in all kinds of construction work. It was capitalized at \$10,000, and \$2000 has already been paid in. Officers were elected as follows: E. S. Boyd, of Woodbury, president; E. C. Crocker, secretary and treasurer; board of directors, E. S. Boyd, E. C. Crocker, William A. Redden, Clifton J. Harvey and A. D. Warner. It is more than probable that the contract for building the Moodus & East Hampton Railway will be given to the Mutual Construction Company, although no contract has as yet been made.

WILMINGTON, DEL.—At a meeting of the stockholders of the Wilmington & New Castle Electric Railway Company, held July 10, the following directors were elected: Peter J. Ford and Peter L. Cooper, Jr., of Wilmington; K. J. Koch, of Pottstown, Pa.; F. H. Treat, of Wayne, Pa.; R. Steen Martin and C. P. King, of Philadelphia, and Harry A. Richardson, of Dover. Officers were elected as follows: F. H. Treat, president; R. S. Martin, secretary; C. P. Kink, treasurer.

JOLIET, ILL.—The City Council has passed, over Mayor Mount's veto, the ordinance granting the Joliet Railway Company a twenty-year franchise for a double track on its new Chicago-Joliet lines, and a franchise for a line across the new bridge over the drainage canal at Cass Street. Mayor Mount attempted to get clauses inserted providing for a larger compensation, for restriction of the rate of fare, and for other restrictions, but his objections were voted down by the Council.

MACON, ILL.—The Hervey City & Southern Electric Railway Company has been incorporated, with a capital stock of \$15,000, to construct an electric railway from Hervey City to Shelbyville. The incorporators and first board of directors of the company are: J. S. Butrum, of Decatur; Robert B. Hennigh, of Prairie Home; Robert H. Woodward, Harold R. Woodcock and John M. Turner, of Macon.

GALESBURG, ILL.—At the annual meeting of the stockholders of the Galesburg Electric Motor & Power Company, held July 9, the old board of directors was re-elected for another year, and John G. Vivion was chosen to succeed the late Wilkins Seacord. The other directors are: B. F. Arnold, Robert Chappell, W. W. Babcock, J. K. Mitchell, G. L. Price, Fred Seacord and Loren Stevens. The usual reports were received and submitted to committee for examination and the board of directors did not meet at the close of the session of stockholders. The present officers will hold over until the meeting of Aug. 7.

INDIANAPOLIS, IND.—The County Board of Review defends adverse criticism of its action in having reduced the assessment for taxation against the Indianapolis Street Railway Company \$500,000, asserting that at the time the State Board raised the valuation to \$3,000,000 last year, there was prejudice against the company. The Board says that it is certainly unfair to assess the regular dividend-paying companies like the Belt Railroad and Stock Yards companies and the gas companies at \$2,500,000 and \$1,000,000 respectively, and placed the Indianapolis Street Railway Company at \$3,000,000, when no dividends were being paid and the stock selling for 22 cents. The company's revenues, it was said, were also reduced \$30,000 a year by its bonus to the city, the people were getting a 4-cent fare and the system was being improved at large expense.

FT. WAYNE, IND.—The Knickerbocker Trust Company, of New York City, has entered suit in the United States District Court against the Lake Side Street Railway Company, asking that a receiver be appointed for the company and seeking to foreclose a mortgage on the property for \$60,000, with accumulated interest. The suit is also against the Ft. Wayne Traction Company. The petition asks that the entire plant be sold to satisfy the claim, and that if the proceeds of the sale be not sufficient to satisfy the mortgage,

the bondholders be made personally liable. It also asks for an injunction prohibiting the directors from transferring any of the property of the road without the consent of the court.

ROCKVILLE, MD.—At a special meeting of the Mayor and Council, held July 7, the ordinance granting the Washington & Rockville Electric Railway Company right of way along the main street of the town from the present terminus of the road at the fair grounds to the court house was rejected, and a committee, consisting of Mayor Spencer C. Jones and Councilman Hattersley W. Talbot, was appointed to prepare an ordinance which will meet with the approval of the Council, as well as the wishes of the people of the town. The law requires that the action of the Council shall be ratified by a majority vote.

BANGOR, MAINE.—The employees of the street railway companies operating in this city received the following notice from the Bangor Young Women's Christian Temperance Union July 3: To the conductors and motormen of the electric cars, the members of Elizabeth Yates, Y. W. C. U., wish to express their sympathy for the long and fatiguing labors of the men who run the cars; and as a token of respect felt for the constant care and kindness shown to those who ride, and for the fortitude which faces all the weather that comes seven days in the week; and as an invitation to the total abstinence principles which in railroad men are so important to the safety of the public, they hereby extend an invitation to each superintendent, conductor and motorman to call at the waiting room, 17 Main Street, on Wednesday, July 4, after 9 o'clock a. m., and receive a bouquet. THE Ys.

MILFORD, MASS.—As the result of an agreement which was reached July 12, the Milford, Attleboro & Woonsocket, the Milford, Holliston & Framingham, the Marlboro, Westboro & Grafton street railway companies have virtually combined their interests. Directors I. A. Kensey, G. A. Butman, I. W. Downs and James Harwood, of the Milford, Holliston & Framingham Street Railway, have formally petitioned to the Selectmen of Milford for permission to extend their line to the Hopkinton town line.

WEBSTER, MASS.—Car No. 14 of the Worcester & Webster Street Railway Company collided with car No. 13, of the Webster & Dudley Street Railway Company shortly before 8 o'clock on July 4, killing two persons and injuring forty. The accident occurred at a point opposite the estate of the late W. S. Slater at East Webster.

WORCESTER, MASS.—A car of the Worcester Consolidated Street Railway Company jumped the track on July 9 and crashed into a farm wagon, spilling the market vegetables, which the latter contained, over the roadway. Three passengers were injured by the accident.

IONIA, MICH.—There are prospects of a bitter franchise fight here. Frank H. Talbot, of Detroit, has signified his intention to build an electric railway from Ionia to Saranac, Lowell, Ada and Grand Rapids, and now T. B. Preston, representing Ionia and Detroit capital, has announced that he will apply to the Council for a line to take in the Crystal Lake resort, with the probable extension later to Portland, Grand Ledge and Lansing. As the latter proposal is largely backed by local capitalists there are at this early date indications of partiality for the local enterprise.

DETROIT, MICH.—A car of the Sherman Street line here jumped the track July 4. Six persons were injured by the accident.

ST. LOUIS, MO.—The St. Louis County Court has passed an order granting the St. Louis & Fenton Railway Company an extension of time in which to begin work on its proposed electric line from the city limits at the Morris Road to Fenton.

NEVADA, Mo.—At a recent meeting of the Missouri Water, Light & Traction Company, Thomas Donahoe and Miss Ida Moran were elected directors to fill the vacancies caused by the resignation of S. A. Wight and C. M. Shartel. H. M. Duck resigned as treasurer of the company and was elected vice-president, and Miss Ida Moran was chosen treasurer of the company.

KANSAS CITY, MO.—Two persons were injured in a rear-end collision of electric cars here, at Independence Avenue and Campbell Street, on July 4.

ST. LOUIS, MO.—The St. Louis Transit Company has just put in operation two loop systems, which are intended to relieve the congestion on the Transit lines in the West End. The new loops will greatly facilitate the handling of heavy crowds which patronize the summer gardens and other resorts in this district.

CAMDEN, N. J.—The street committee of the Camden City Council has adopted the Bonham fender, with the Sterling wheel guard, for use on all trolley cars in Camden. This fender had been selected by the Camden & Suburban Railway Company.

WESTFIELD, N. J.—On July 11 the Westfield & Elizabeth Street Railway Company reduced the fare from this place to Rahway from 10 to 5 cents, and passengers are now being carried from the Westfield to the Rahway depots at that price. The company is now preparing a ticket which will be good for a continuous ride from Elizabeth to Boynton Beach for 20 cents, providing the passenger asks for the ticket when the fare is paid. The regular fare to Boynton Beach at the present time is 25 cents. This new ticket will be put in use at an early date.

BROOKLYN, N. Y.—The gripmen and conductors on the Brooklyn Bridge have been organized into an open union, under the auspices of the American Federation of Labor. A charter was received from the A. F. of L. a few days ago, and the organization will be known as the New York and Brooklyn Bridge Employees' Protective Association. The members deny that they have organized for the purpose of making new demands.

LIBERTY, N. Y.—The Liberty & Jeffersonville Electric Railroad Company has contracted with the Houk Falls Power Company, of Napanoch, to furnish power for operating its new road.