

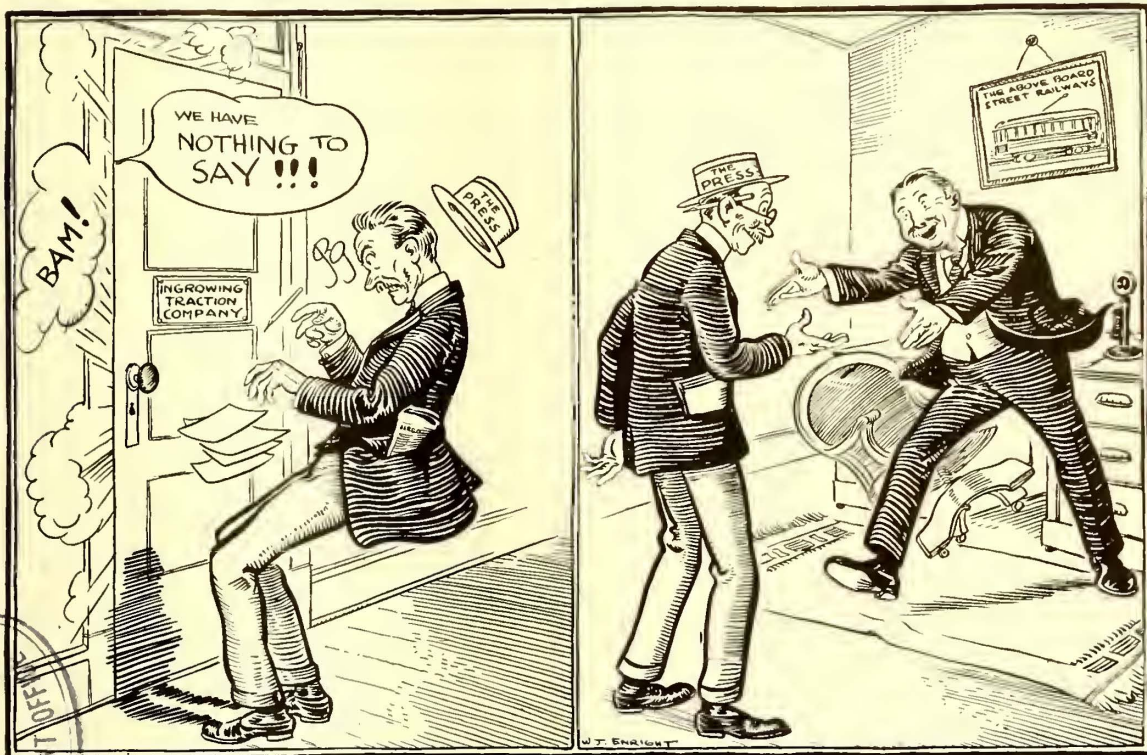
# Electric Railway Journal

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No. 15



WHICH ONE OF THESE COMPANIES IS LIKELY TO BE BEST UNDERSTOOD

## The Open Door vs. The Shut Mouth

People instinctively distrust what they do not understand.

The savage did not understand the sun and moon and so he made gods of them and exhausted his ingenuity in propitiating them.

Modern man is not so strong for propitiating; he is more likely to throw bricks at what he doesn't understand or what he comes to dislike by reason of misunderstanding.

To most people the working of an electric railway is a mystery.

They see a stream of nickels going into the concern which, usually, conducts its affairs behind closed doors.

There are stories afloat of dark deeds committed in times past behind those doors.

There is apparent reason for a lot of dissatisfaction with the service rendered by this concern.

People have been known to stand, holding on to straps, during the rush hours.

Indignation has been aroused by the fact that

6 cents worth of transportation has not been given for 5 cents, with a free transfer thrown in.

And when complaint is made the popular idea is that a marble-hearted official uses the complaint for lighting his 50-cent cigar.

And all this because the people on the outside can't see what is really going on inside.

Question: Whose fault is it?

Answer: The railways.

Question: What is the cure?

Answer: Turn the inside outside.

Let them see in; tell them what you are doing and why; what you are not doing and why not.

Make a reputation for efficiency and frankness instead of for crookedness and concealment.

If the inside of the railways is not turned outside by the railways, the turning will be done by others—they are already doing it in fact.

Beat them to it with a whole-hearted policy of publicity.

[“When” “How” and “What With” are the subjects of future Talks on Publicity]

**THE "JOURNAL" AND THE CONVENTION** This issue of the *ELECTRIC RAILWAY JOURNAL* will first reach many of our readers at the Atlantic City convention, and to them this paper extends its best wishes for a most profitable gathering. In the next issue, that of Oct. 14, the report of the convention will be published. The *JOURNAL* this year, as last, will not publish a daily report of the convention proceedings. Instead the papers and discussions of each association will be grouped together in the report issue of Oct. 14, forming a complete story of each series of meetings. A small daily will be published during the convention simply to give prompt publicity to official announcements and other material of immediate but transient interest. The report issue will, we hope, not only accurately record the ideas expressed by the speakers at the meetings and the progress made by the industry as epitomized in the committee reports, but will convey to its readers everywhere the spirit and enthusiasm of the convention.

**CONCLUSION OF THE NEW YORK STRIKE** The New York strike has now passed into history, and the results are the subject of congratulation to the railway companies, their employees and the public not only in New York City but also in every other city in the country. Employees of electric railway companies can now feel more safe in their jobs from outside interference, and the companies and the public are more assured of freedom in transportation. Too much credit cannot be given to the New York managers for the stand which they took and for the public relations work which had laid the basis for a proper general understanding of their position. In Brooklyn also, a most notable demonstration of loyalty was shown. This found expression in a mass meeting of employees held last Saturday night when mutual felicitations were exchanged between officers and men over the outcome on the B. R. T. The keynote struck was that both officers and men had confidence in each other, and that under the company's organization of departmental trustees, just as in the case of the Interborough and New York Railways internal brotherhoods, both sides can settle any possible points before they can give friction.

**CODIFYING CLAIMS ETHICS** Again the Pittsburgh (Pa.) Railways has made an important advance in its efforts to free modern claim work from the prejudice and suspicion inherited from the old "strong-arm" days in the electric railway industry. In a "Code of Ethics and Policies" that has just been compiled, as noted elsewhere in this issue, this company has with most commendable frankness stated the ethical principles, general policies and mode of procedure to be followed by it in the handling of claims. The present advance made by the company lies not in the fact that the code constitutes any new development, for it is simply a permanent collation of the fundamental principles that have been used by the Associated Bureaus of the company under the guidance of Cecil G. Rice. It comes rather because the company has thus

dared openly and officially to state, for the benefit of all parties concerned, its exact position in claim matters. The act is decidedly worthy of emulation. If the practices followed are just and fair, there is every reason for letting the public know what they are.

#### ELECTRIC RAILWAY POWER SUPPLY IN ST. LOUIS

Those electric railway executives whose interests require them to follow the power supply question closely can with profit focus their attention on the interesting situation outlined in the special report of the directors of the United Railways of St. Louis abstracted in our issue for Sept. 23, page 531. Briefly, these are the facts: (1) The railway is buying approximately 60 per cent of its required electrical energy from the company which locally distributes Keokuk power on the basis of a 60 per cent load factor and at a cost of slightly less than 0.6 cent per kilowatt-hour. This energy is purchased on a long-time contract. (2) An additional 30 per cent or more comes at present from the local light and power company, this being on a 45 per cent load factor basis and costing about 0.84 cent per kilowatt-hour. The contract for this power is temporary, expiring in 1919, having been drawn to provide for the uncertainties attending the inauguration of the Mississippi River Power Company project. It provides for an annual fixed charge of \$15 per kilowatt and a secondary charge of 0.45 cent per kilowatt-hour. (3) The rest of the energy is supplied from the company's own steam plants, now antiquated, at a cost of at least 1 cent per kilowatt-hour. It is estimated further that by enlarging and renovating these steam plants, energy could be produced at 0.8 cent, or in a new plant that the cost would be 0.6 cent. The question is now whether the company should put up a modern steam plant to supplement the Keokuk hydraulic power or should provide for a gradually increasing supply from the local central power company.

The circumstances seem to indicate the advisability of the latter, for the same reasons that have dictated the combination of lighting and railway power plants elsewhere. These are, briefly, that the peaks of the railway load do not coincide with those of the lighting and power load, so that it would not be necessary to add as much generating equipment in the power company's stations to care for the railway load as would be needed in a separate plant. Again, there is economy due to the lower real estate, operating, maintenance and overhead cost per kilowatt, which naturally results from concentration of generating capacity.

The reader has already raised the mental question: "Why not take more Keokuk power since it is so cheap?" The answer is simple: Probably no more could be obtained at the price, an exceptionally low one secured because the hydraulic power company was desirous at the start of securing a foundation load of size and permanence. But even if it could be secured at the present price per horsepower-year it does not follow that the additional energy drawn would be cheap per kilowatt-hour, because it requires a high load factor to insure such a condition.

### PACIFIC COAST DEMANDS QUICKER SERVICE

The officials of practically every electric railway on the Pacific Coast are casting about diligently for some means of economically giving a quicker service that will put the street car more nearly on the plane of the automobile in point of rapid transit. Many companies are experimenting with "one-man" cars, some are operating auto bus and jitney lines as feeders, and every possible solution of the problem is receiving careful consideration. The seriousness of the situation growing out of the competition of the jitney and private automobile can best be judged by the statement that the earnings of the six largest companies in the five chief coast cities are falling below normal by from \$500,000 to \$1,000,000 each per annum, the greater part of the loss being attributed to this condition.

A manager of a company in the Northwest recently stated that the present problem is more difficult than the one faced when electric traction first appeared and it became necessary to change over from cable to electric drive. When that change was made, much experimenting was done, the public was patient with slow progress and the railways did the pioneering. In the present situation the evolution has been very rapid and has been fostered by competition. Jitney operation has not been on a feasible, business-like basis, it is true, but it has developed a popular demand for more speedy service and inclined the public to impatience with the old operating schedules.

This would seem to put the present state of affairs in a discouraging light, but there are hopeful signs in sight. With the realization of what the jitney is doing in the transportation field, the public is coming to recognize the obligations and responsibilities which it must assume, and regulation is slowly but surely following. News also comes from the Pacific Coast of the proposed formation of a jitney operating corporation, holding franchises and having an ultimate capitalization of \$100,000. If this is an indication that the "here to-day, gone to-morrow" irresponsibles will soon be out of the way, competition will be short and decisive. When the time comes that the jitney is bearing its proper burden and is under adequate regulation, the best and most economical public transportation agency will ultimately win, and that is undoubtedly the electric railway.

It is manifest, however, that the electric railway must adapt itself to such changes in conditions as may have been brought about by automobile competition. A representative of this journal has just completed a trip along the Pacific Coast and has found practically unanimous agreement that the most promising direction to work is with some form of lighter weight equipment. In both Seattle and Portland recent experiments with light-weight "one-man" cars have been so satisfactory, even on busy lines, that this idea is being developed further at once. In southern California, experiments with gasoline-driven cars have been made at several points; one of the results of these is the Fadgl flexible car used on the local systems in Fresno and San José, as described in the issue of Aug. 19. It is the feeling on

the Pacific Coast that Eastern interests have not fully recognized the difficulties which the Western roads are facing, and it is the hope of the Western roads that one of the results of the interchange of ideas at the Atlantic City convention will be some constructive, practical suggestions that will be a real help to them in the solution of the quicker service problem.

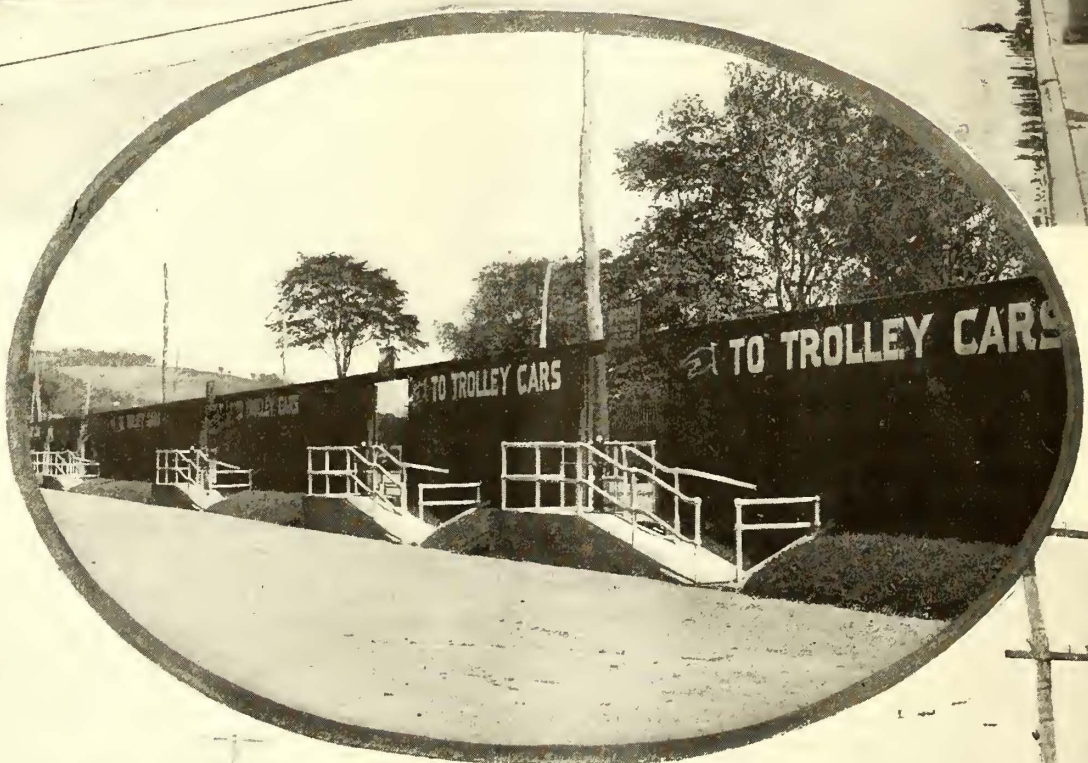
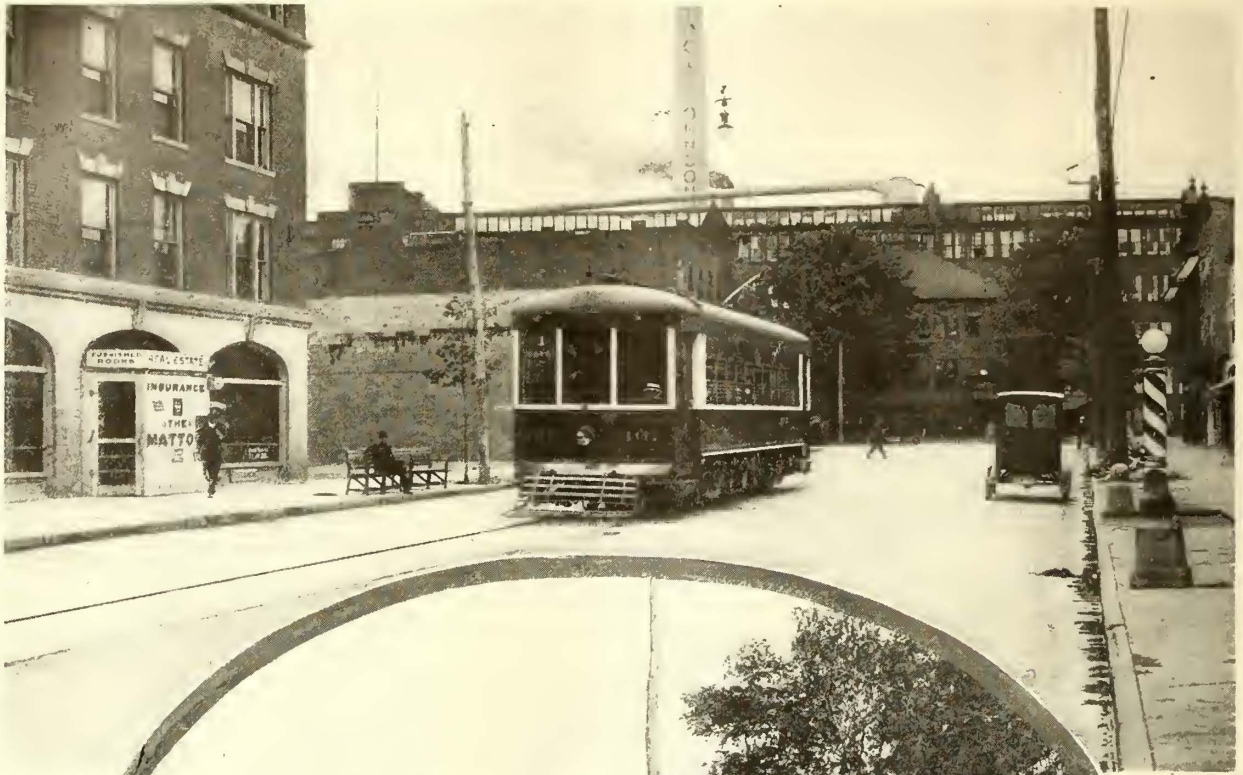
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### CONTRACTS WITH EMPLOYEES

The many references, mostly vague or incorrect, which daily newspapers in New York and elsewhere recently made concerning individual agreements used for electric railway employees in Indianapolis, led us last week to prepare a digest of the facts relative to such contracts. The history of the so-called Indianapolis precedent shows that in 1914, after an arbitration award under a three-year peace settlement, the Indianapolis Traction & Terminal Company circulated individual working agreements in order to remedy a few impracticable working conditions in the award. In the major matters of not recognizing the union, maintaining an open shop and providing against strikes through the use of arbitration, the individual contracts simply echoed provisions of the arbitration award, and the permanent arbitration board deemed them not inconsistent therewith. When later the leaders of the Amalgamated Association tried to force the cancellation of the contracts, they were restricted by the courts from interference on the ground of being strangers thereto.

It is academic to discuss what legal action might have resulted in New York had there been in force on the Interborough Rapid Transit Company a formal settlement plan and arbitration agreement as in Indianapolis. It seems worth while to note, however, that the courts will evidently uphold utilities and their employees in their right to make individual contracts, and will not permit disinterested third parties to bring about a breach of such contracts. Furthermore, individual agreements make it easier to proceed in civil action against employees in the case of an unlawful suspension of work.

Another suggestion is that of Henry R. Towne and approved by the Merchants' Association of New York, as stated last week, that a general contractual relationship be established by law for the employees of all utilities. Under this plan the tenure of service would be so regulated by federal and state enactment that everyone voluntarily accepting utility employment would be obligated by contract to continue therein for a specified time, with proper provisions for the punishment of violations as well as for an honorable release from the contract for valid cause. The plan would permit union membership, but would prohibit concerted action to suspend service and would settle disputed wage and working questions by arbitration. The utility companies can profitably make a study of this bill, especially as the Merchants' Association of New York thinks so well of it that it has asked the Chamber of Commerce of the United States to take a referendum of its members upon its provisions.



Suburban Type of Car Used on Endicott-Union Line

East Gates with Turnstiles and Fare Boxes for Handling Baseball Crowds

Two-Car Train Loading at Terminus of Suburban Line

Binghamton Traffic—Typical Views on the Lines of the Binghamton (N. Y.) Railway



BINGHAMTON TRAFFIC—VIEW ON SUBURBAN LINE ALONG SUSQUEHANNA RIVER

## Rehabilitating Railway Receipts

In the Face of the Situation in the Last Two Years the Binghamton (N. Y.) Railway Has Reached the Strongest Position in Its Recent History Through the Introduction of Energetic Methods of Stimulating Receipts and Improving Operating Conditions

AS an example of the opportunities that are still latent in the electric railway industry, the recent record of the Binghamton (N. Y.) Railway has peculiarly timely interest. The situation that this property faced in the summer of 1914 was apparently typical of that confronting the industry as a whole, but since that date the introduction of new operating methods has placed the property on the strongest income-producing basis in its history, and the results constitute good evidence that the transportation field is still fallow. During the past two years the company's business has undergone a complete revival. Its net revenues each month are consistently showing increases of more than 15 per cent over the previous year's figures, and its gross revenues are growing steadily as the "riding habit" is developed among the city's population.

These improved conditions are represented in the accompanying graph, which shows, for the last seven years, the total annual figures for gross receipts. From this it will be seen that up to December, 1912, the gross receipts had maintained a regular annual increase, such as might be expected in any normally-growing city of moderate size. During the year 1913, however, there was a distinct falling off in the rate of increase, and this, coupled with a marked increase in car-miles, and also an increase in car-hours, produced a sharp decline in operating income.

During the year 1914, however, subsequent to its purchase by the Scranton & Binghamton Railroad Company, the property came to be operated under an entirely new policy. A change in management took place

during August, 1914, and there was immediately inaugurated a vigorous campaign of development of the unexploited sources of railway income. The result of this was a marked increase both in gross and net receipts, even for the year ended Dec. 31, 1914, or after less than six months of operation under the new methods. During this period the car-mileage increased slightly, but the car-hours displayed hardly any increase, resulting in a change from 8.3 car-miles per car-hour in the year 1913 to a figure of 8.7 car-miles per car-hour during 1914. The increased schedule speed was maintained during the year 1915, giving a figure of 8.6 car-miles per car-hour. An increase of 25 per cent in operating income for the year 1915 over the previous year took place despite the fact that a practically complete overhauling of rolling stock, track and line was going on during the whole period, all of the old equipment that has been retained in service receiving extra heavy repairs to place it in a condition as good as new.

Briefly speaking, these results have been brought about by the introduction of a faster and more regular service, short headways on the shorter runs, and a consistent effort to meet, and if possible to anticipate, the patrons' needs. That the latter policy has produced results is perhaps best demonstrated by the following reproduction of a resolution which was passed at a popular mass meeting and published in the local newspapers, and which, in this day of suspicion and controversy between the public and local utilities, can be characterized only as extraordinary:

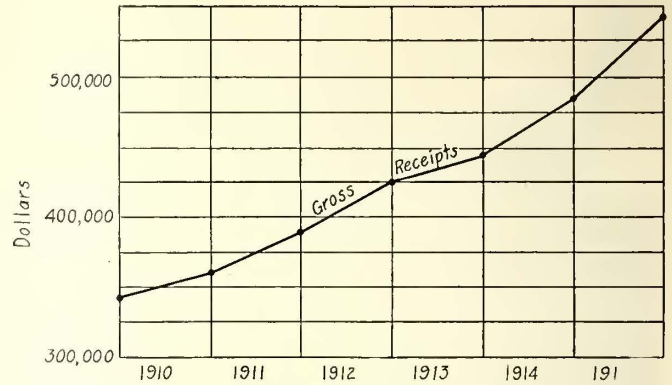
“At a meeting of taxpayers and street car patrons at Port Dickinson on Dec. 21, 1915, the following resolution was unanimously adopted: *Whereas*, the Binghamton Railway Company having improved and extended in a most satisfactory manner its roadbed in the village of Port Dickinson, and promptly provided a new schedule with modern pay-as-you-enter cars, faster running time, etc.; *Resolved*, that we herein express our appreciation of same, and desire to state that we wish to co-operate as best we may with the present and future plans of the railroad company.

[Signed] H. D. HARRIS, *Chairman.*  
E. E. LANTIMAN, *Clerk.*”

In the company's recent record the increase in gross receipts is, of course, the most interesting feature, because the new business has been in no way due to the receipt of war orders by the local manufacturers, the industries of the city of Binghamton being confined practically to the manufacture of shoes and cigars. From the accompanying map it will be seen that the center of the city lies in the peninsular formed by the junction of the Chenango and Susquehanna Rivers. About this section the city and its suburban towns straggle irregularly. The population of the city itself is about 55,000, but the electric railway system serves several other towns outside of these city limits, which increase the number of possible riders by about 25 per cent. However, a large part of the population of the city is collected in residential districts surrounding the business center at a radius of about 1½ miles.

It was this source of revenue that the company sought first to develop. Owing to the fact that, practically without exception, these districts were little more than a mile from the business section, almost all of the residents could walk from their homes to the city within a reasonable time, yet, from the standpoint of the railway management, the short-haul traffic that they could bring to the company was most desirable. The first step to-

This was accomplished without increasing the number of cars in service, because under the original conditions all cars had been run into the center of the city and turned there for their return trips. Under the new scheme of operation the cars were run through the center of the city wherever possible, thus avoiding the waits that had occurred at the central terminal originally used. This plan, in fact, permitted the removal



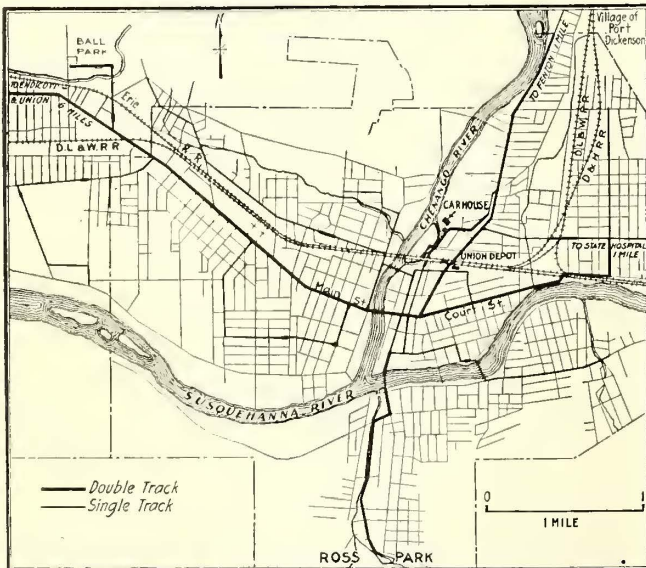
BINGHAMTON TRAFFIC—GRAPHIC RECORD OF GROSS RECEIPTS FOR PAST SEVEN YEARS

of cars on several of the lines, even though the frequency of service was increased owing to the faster schedule speed and the elimination of delays in the center of the city. Again, on the trunk line that appears on the accompanying map running west from the city, there are operated cars which serve on four different runs to branch lines, and it was found that under the old conditions all four of these cars ran in a bunch at a fifteen-minute headway over the part of the trunk line that was near the city. In the rescheduling these runs were so planned that the cars moved over the trunk line at regular intervals of less than four minutes.

Time points were established on all of the lines, and these were rigidly adhered to, the arrangement of the points and the running times being worked out by having an expert motorman make runs over the line so as to determine from actual practice just what time could be made. This, alone, increased the schedule speed on all runs very materially. Subsequently, new rolling stock was purchased, as described in the *ELECTRIC RAILWAY JOURNAL* for Dec. 25, 1915, and this improved the schedules still further. An example of the extent of this change may be cited in the case of one line upon which the schedule speed with the old cars was increased 11 per cent, and when the new cars were placed in service the increase in speed rose to 17 per cent over that which had been in effect prior to the change.

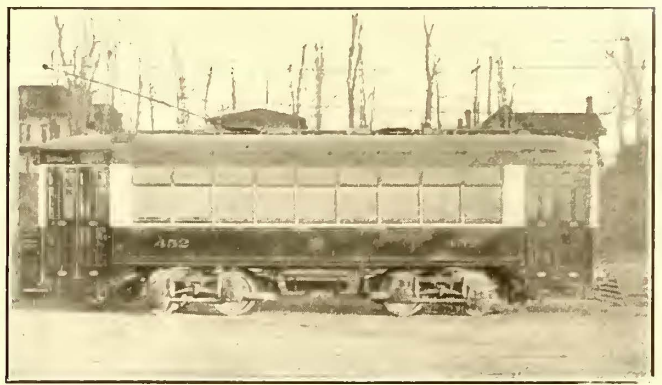
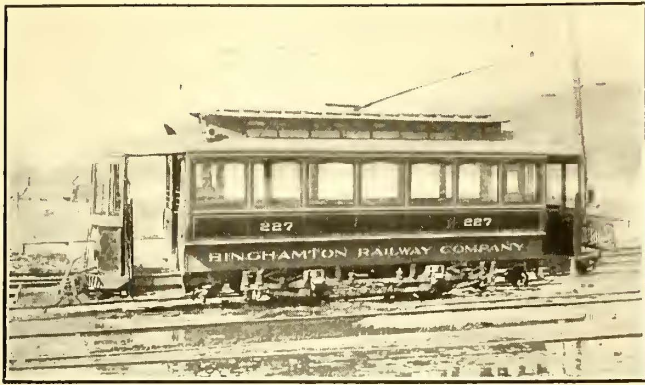
Another circumstance which tended toward slow schedules under the old conditions was that the residents of the city had formed habits of deliberation in boarding and alighting from the cars. Frequently, as much as fifty seconds were consumed at a stop where passenger interchange normally should be completed in ten or fifteen seconds. This, of course, worked to the detriment of the running time, and to meet the situation signs requesting co-operation from the public were posted in the cars. These have produced excellent results not only in accelerating traffic but also in keeping the cars clean.

Again, on one of the lines—that extending northward from the city to the village of Port Dickinson—the schedule speed was increased by rebuilding the track and putting on new cars under a faster running time. The traffic over part of this line is fairly heavy, and in consequence a ten-minute headway was established



BINGHAMTON TRAFFIC—MAP OF BINGHAMTON (N. Y.) RAILWAY LINES

ward this end was a complete rescheduling of the runs on the entire system. In this, all schedules were considered a whole so that they could be made to dovetail in together, and thus make the headways between cars that were near and within the business section regular and at short intervals. Also, on all of the short lines radiating from the business district the headways were very much decreased, so that the frequent service would encourage the use of the cars.



BINGHAMTON TRAFFIC—TYPE OF CAR ORIGINALLY USED AND NEW TYPE OF CITY CAR THAT DISPLACED IT

for about 2 miles north of the city. As the outlying sections of the line would not support such frequent service, the schedule was so arranged that the ten-minute headway on the inner section was made up with turn-back cars, a twenty-minute service being supplied for  $\frac{3}{4}$  mile beyond the first turn-back point and a forty-minute service being given to an outlying section about 1 mile beyond this. This turn-back scheme, together with the new cars and tracks, as well as new paving that was laid, gave very great popular satisfaction, while the ten-minute service near to the city served as a definite incentive to the short riders.

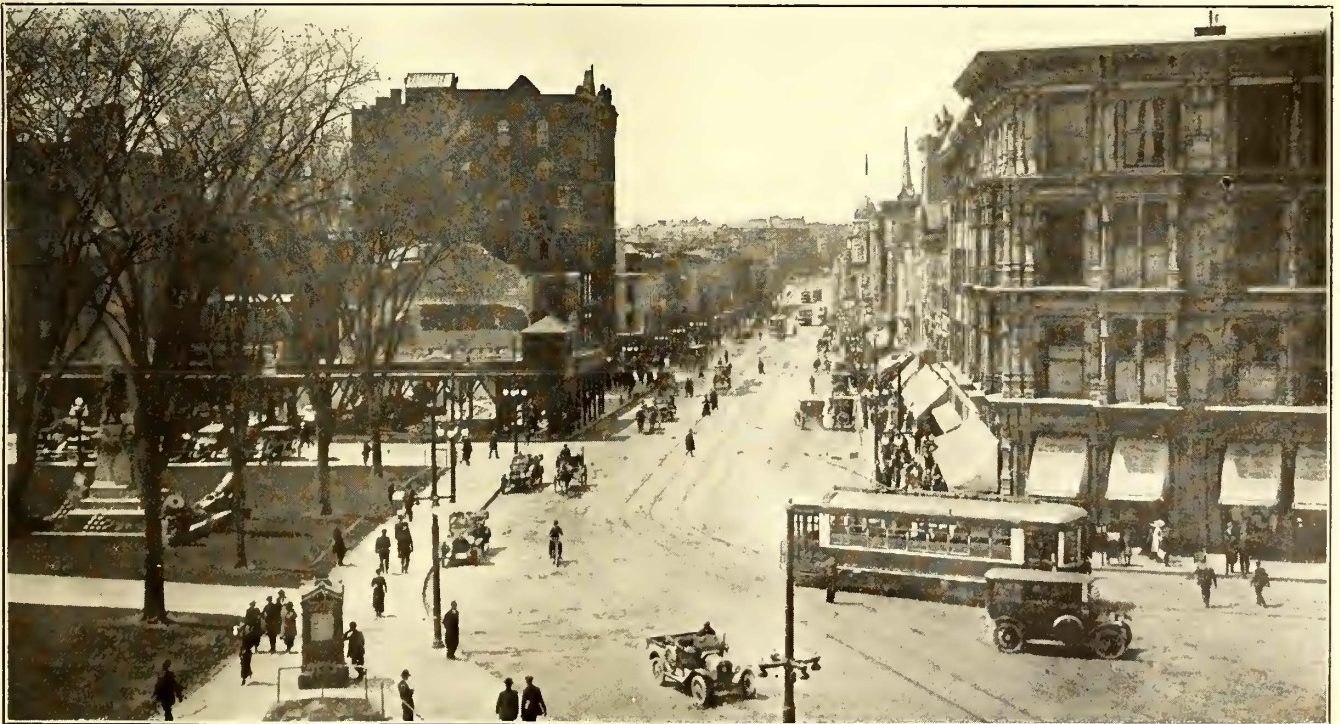
For the long rides, frequency of service was not considered so necessary, and on the suburban line between Binghamton and the towns of Union and Endicott, which lie about 9 miles west of the city, the original headway of fifteen minutes was increased to twenty minutes. But with the new service the schedule time for the run was reduced from fifty minutes to forty-five minutes. This permitted the handling of the traffic with one car less than was previously operated, and with the new cars and the faster schedules that were introduced the change met with the patrons' approval.

An incidental feature of the campaign for increased gross receipts consisted in the introduction of improved

fare collection methods. Prior to the change in management of the property, only about 12 per cent of the cars were of the prepayment type, and on none of these were fare boxes used. Fare boxes were, therefore, placed upon all cars, where this was possible, and were installed on all of the new cars purchased by the company. On some of the old cars with small platforms, where the use of fare boxes was impossible, Rooke registers were provided for the conductors, this plan being designed to protect them from misunderstandings under the close system of inspection that was also introduced.

By no means a small part of the recent success of the company has been due to its present popularity with the local residents. Probably the first step that was taken by the new management toward this end was the construction of a short line to serve a local baseball park, this being an extension over which there had been a long-standing dispute between the railway and the baseball fans, who constituted a large portion of the populace.

The extension, of course, is used very infrequently, and for no other purpose than for serving baseball crowds. In consequence, it really cannot pay, and this was the reason that had kept the railway from building it originally. It is provided with thoroughly modern



BINGHAMTON TRAFFIC—COURT STREET, BINGHAMTON'S MAIN THOROUGHFARE, WHERE CROSS-TOWN RUNS ORIGINALLY TERMINATED

terminal arrangements so that crowds can be handled without delay. Ramps, gates, turnstiles and recording fare boxes have been installed, and all fares are collected as passengers leave the grounds before they board the cars. The park, it may be said, had been donated by a prominent manufacturer of the city, and since the location which he chose was about 1800 ft. away from the then existing railway line, there was a very considerable popular demand for railway facilities to serve it, regardless of the question of profit or loss to the railway. When the extension was finally built the local press reported the construction with elaborate notices, and this definitely inaugurated an era of good feeling on the part of the public.

Subsequently, a particular point was made of calling upon prominent business men and discussing with them possibilities for improving the service in general. Through these interviews a number of excellent suggestions were received, and they were promptly put in force, leading other citizens to interest themselves in street railway matters. Eventually the public at large became interested and began to boost the railway company. Naturally, under the circumstances, some suggestions as to improvements were received without being adopted because of their impracticable nature, but whenever this was the case a special point was made to explain in detail the reasons why the suggestions could not be put into practice.

The most striking result of the popularity thus acquired by the railway came up in connection with the jitney-bus craze when it reached the city of Binghamton. The first attempt to operate jitneys came shortly after the extension had been made to the local baseball grounds, and the first jitneys were operated between the city and this park. As soon as this competition began, the attention of several of the influential citizens was called to the fact that the ballpark jitney runs would be only an entering wedge for jitney operation generally, and that, in consequence, it would be desirable to advocate publicly the patronage of the railway to the exclusion of the jitney buses. As a result, the competition died within a few weeks, even without the passage of any regulatory ordinance.

## 2000th Issue of London "Electrician"

Commemorative Number Contains Authoritative Articles Summarizing Progress in Electric Traction, Prime Movers and Other Divisions of Its Field

**I**N commemoration of the issuing of the 2000th weekly number of the *Electrician*, London, that journal on Sept. 15 published a special number largely taken up with retrospective articles covering the several divisions of the field of electrical engineering.

The article on electric traction, written by Dr. H. F. Parshall, covers the history of electric traction, in America particularly. The writer states that while the physical knowledge on which electrical engineering is founded is largely English in origin it is remarkable that so much of the actual development and application have been on American soil. He believes that the technical application of knowledge is most likely to attain rapid development in those countries where industries find the greatest protection and there is the greatest security afforded for capital invested in such industries.

The development of electric power stations was treated by P. C. Hunter and that of the steam boiler by D. Wilson. Mr. Hunter points out that the pioneers in steam power development worked along lines of im-

proving thermal efficiency, whereas during the last ten years engineers have been content to develop in the direction of improving the internal efficiency of the turbine and reducing its capital cost per kilowatt by the development of sets of increasing size and speed. The economical advantages obtained in this way have led to the cheaper production of electricity, increased sale and improved load factor, which in their turn have permitted the use of still larger turbines. He gives a graph showing the increase in load factor of electricity supply stations from less than 10 per cent in 1897 to 30 per cent in 1915.

Mr. Wilson traces the development of different types of boilers and shows the relation of increases in steam pressure to boiler design progress. Up to 1860 pressures did not show much increase and were lower than 40 lb. per square inch, but since that year the increasing pressure has been very rapid, assisting the development of the water-tube boiler. He states that during the past ten years there has been no fundamental change in water-tube boiler design. While types have varied the higher efficiency of the boiler to-day is due almost entirely to improvement in structural design and in the better assembly of the boiler house plant generally. These features he covers in considerable detail.

## Code of Ethics and Policies

Associated Bureaus of Pittsburgh Railways Issue Book Frankly Stating Position on Claims for Injuries and Damages

**T**HE Associated Bureaus of the Pittsburgh (Pa.) Railways and its allied companies have prepared for public distribution and for their own use a book entitled "Code of Ethics and Policies," which gives in detail the position of the companies on matters arising out of the consideration of claims for injuries and damages. Thus another step toward the perfecting of modern claim work has been taken by these bureaus, whose work along clerical, litigation, adjustment, inspection, medical, safety and welfare lines was described in detail in the *ELECTRIC RAILWAY JOURNAL* of July 24 and Sept. 11, 1915.

According to an executive pronouncement by Cecil G. Rice, assistant to the president, who is in charge of the bureaus, the circumstances surrounding each particular accident readily distinguish it from all others, but the underlying principles which guide and control the attitude and action of the Associated Bureaus in connection with such occurrences are comparatively few. Moreover, the codification of these principles is said to offer such convincing proof of sincerity and fair dealing on the part of the company as may reasonably be expected to encourage and develop a reciprocal attitude from others. To make the official character of the code absolutely clear, it is stated by Mr. Rice at the beginning that only such action on the part of members of the Associated Bureaus as is in complete harmony with the spirit and the letter of the "Code of Ethics and Policies" will receive official approval.

The general position of the company in the matter of claim work is ably summarized in the "Foreword," as follows:

"The Associated Bureaus hold in great regard their high calling to be mediator between those who have fallen into suffering and misfortune by reason of accident, on the one hand, and the companies, in connection with whose properties that may have occurred, on the other. It is earnestly hoped that all such persons will retain in their attitude toward the Associated Bureaus a spirit of amicability and confidence. Toward



all such persons the Associated Bureaus will exercise a similar friendly regard in all of their dealings.

"All accidents and resultant injuries are as sincerely regretted by these companies as by those to whom they befall. It is then both harmful and erroneous to harbor a spirit of enmity or prejudice toward the companies, or the Associated Bureaus, solely because an accident has occurred. It is the desire and intention of the Associated Bureaus that such intercourse as may follow upon the occurrence of an accident shall result in increase of mutual respect and good understanding between all of the parties concerned.

"The Associated Bureaus hold as their high moral duty the prevention of accidents, both by anticipatory means and by searching inquiry into accidental occurrences. They seek to effect and maintain relations of fairness and good understanding between the companies and their patrons generally, and particularly with those persons who have sustained injury or material loss by accident in connection with the companies' properties, to the end that in these contingencies such action may be taken by the parties concerned as will be just, equitable and mutually satisfactory."

The first fundamentals stated by the code are the guiding principles and mode of procedure published in the issue of this journal of Sept. 11, 1915, page 437. To summarize these here, however it may be said that the guiding principles concern the points of maximum accuracy, utmost expediency, absolute fairness, persistent courtesy, minimum consistent expenditures, and perfected co-operation and efficiency. Similarly, the mode of procedure involves the following acts: overcoming prejudice, inspiring confidence, analyzing and reducing to a business basis, creating a desire, causing a determination and satisfactorily closing the transaction. The code also includes ten "fundamental facts," as noted in the above-mentioned issue, which are suggested for the consideration of those who have been or may become involved in accidental occurrences. These facts have mostly to do with claims as a matter of business rather than law, and the reciprocal responsibilities of the public and the companies in handling such a business matter.

In regard to the medical profession, the code takes the point of view that the recognition by the company of the generous proficiency of doctors inspires a respect for their ethical tenets, and also the expectation of a reciprocal observance by them of other ethical procedure, *e.g.*, the general code for the Associated Bureaus. Moreover, the insistent belief that legal advice is unnecessary for the satisfactory disposition of business with the Associated Bureaus is not permitted to hinder full observance of the courteous consideration due to members of the bar. In a special chapter to members of the Associated Bureaus, they are told of the fiduciary relationship which they bear to the organization as a whole, and of their obligation to uphold its honor and dignity in speech and action.

In order to emphasize the main points brought out, the book at its end presents an "epigrammatic recapitulation," from which the following specimen sentences have been taken:

"The public, these companies and their employees form a community of interest, each having reciprocal rights and responsibilities.

"The voluntary adoption of a high standard of action is justification for expecting a corresponding attitude on the part of others.

"Only the one who seeks that to which he has no right can find excuse for objecting to the full details of an accidental occurrence being made known to the Associated Bureaus by those who know the facts.

"To advance the best interests of all concerned by recording details of an accidental occurrence one observes is a duty of citizenship involving no embarrassment or annoyance.

"The mere fact that a person sustains injury by no means warrants a request for compensatory damages.

"Justification for presenting a claim must be based upon the freedom from fault of the person injured and the causal negligence of the person from whom compensation is sought.

"A claim for damages is the same as a bill; it is an allegation of indebtedness susceptible of similar itemization and presentation.

"The unnecessary employment of another to represent one in so simple a matter as the presentation of a claim indicates business incompetency.

"If these companies owe they are not only willing but desirous of canceling the obligation.

"Only persons wanting too much, or something to which they have no right, now find excuse for litigation following accidental injury or damage.

"To discourage all unnecessary litigation is an economic duty of the public.

"Professional solicitors of claims for litigation are a public nuisance. To be solicited by them is a reflection on one's intelligence.

"A doctor whose advice is not for the best physical interest of his patient violates the ethics of his respected profession.

"An attorney who charges an exorbitant fee for collecting a simple bill for damages is dishonest and his client is foolish.

"Confidence begets confidence. The Associated Bureaus have confidence in the inherent reasonableness and honesty of the public."

## Kansas City Safety Campaign Under Way

The safety campaign of the Kansas City (Mo.) Railways is under way in all its phases. Following the first distribution of literature to the schools, essay contests are being arranged, and films are at hand for exhibitions in the schools equipped with projection rooms, and in moving picture theaters. The safety work within the company has also started, expanding safety work that has been done for several years. A general committee manages the entire campaign. This committee consists of E. B. Atchley, publicity agent; Kearney Wornall of the claim department, and J. H. Harvey, superintendent of efficiency. Working directly under this committee is W. S. Woodland, formerly a supervisor. He has been appointed special safety agent. The safety work within the railways organization is under the charge of a central safety committee, with James E. Gibson, general manager, as chairman, Mr. Woodland secretary, and the heads of departments as members. Each department also has its committee, and in each of them are sub-committees.

In the description of the Dallas, Tex., new interurban terminal in the issue of the *ELECTRIC RAILWAY JOURNAL* for Sept. 23, 1916, a typographical error made it appear that all of the interurban lines using the terminal are managed by the Stone & Webster Management Association. It should have read that the Northern Texas Traction Company is so managed, since the Southern Traction Company and the Texas Traction Company are under the Strickland management. The Dallas Interurban Terminal Association is also managed by the Stone & Webster Management Association.

**PARLOR CARS**

**Summer Time is Traction Time**

**Tickets punched the Traction Way**  
SAFETY COMFORT NO DELAY

**THE ECONOMICAL WAY TO ST. LOUIS**

**Your Way Any Hour Any Day**  
ILLINOIS TRACTION

**TRACTION RIVER EXCURSION**

**The WOODS ARE CALLING YOU**  
It's time to get out into the woods. All kinds of things to suggest to take you right into it. The woods and stream are right at your door. All that is necessary is a 15 cent fare.

**Illinois Traction System**  
Your trip to the woods is a complete fishing season of pleasure and rest in a most beautiful spot.

**YOU REALLY SLEEP on Traction Sleepers**

**I.T.S. Makes a hit with**  
THE ROAD OF GOOD SERVICE for Base Ball Fans

**TRACTION EXCURSION**

**LOW RATE to the State FAIR**

**ILLINOIS TRACTION SYSTEM**  
The Road of Good Service

# TRACTION-RIVER EXCURSION



VIA  
**ILLINOIS TRACTION SYSTEM**  
(McKINLEY LINES)

& STEAMER COLUMBIA to Henry, Ill.  
**\$1.00 ROUND TRIP INCLUDING BOAT**  
Sunday, July 30th  
SPECIAL TRAIN LEAVES

HARRISTOWN - 6:38 A.M.	DAWSON - 7:30 A.M.
NIANTIC - 6:46 A.M.	RIVERTON - 7:32 A.M.
ILLIOPOLIS - 6:56 A.M.	SPRINGFIELD - 8:30 A.M.
LANESVILLE - 7:10 A.M.	WILLIAMSVILLE - 8:30 A.M.
MECHANICSBURG - 6:50 A.M.	ELKHART - 8:41 A.M.
BUFFALO - 7:15 A.M.	BROADWELL - 8:47 A.M.

Returning Special Train Leaves Peoria at 7:30 P. M.  
Tickets Good on Special Train Only

**FREE DANCING on BOAT and BASE BALL GAME at HENRY**  
**ROUND TRIPS \$1.00 INCLUDING BOAT RIDE**

For Particulars Phone L T S TICKET AGENT.

**The Road of Good Service to**

**ILLINOIS STATE FAIR**  
**Your Way-Any Hour-Any Day**  
WHEN THE TICKET READS VIA.  
**ILLINOIS TRACTION SYSTEM**  
(McKINLEY LINES)

**LOW RATES—SPECIAL SERVICE**  
**SPRINGFIELD, ILLINOIS**  
**SEPTEMBER 15-23**

# Illinois Traction System Uses Many Forms of Publicity

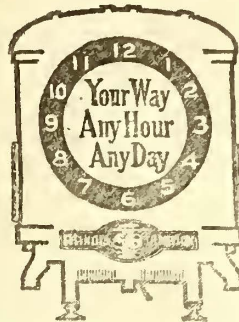
The Accompanying Illustrations Have Been Selected to Show the Several Phases of the Advertising Work Which Is Being Done by This Progressive Electric Railway System

THE department of publicity of the Illinois Traction System is kept busy constantly devising new and attractive ways of obtaining the public's attention. The various forms of publicity employed include newspaper advertising, posters, car cards, billboards, moving-picture slides, dodgers, postcards, playing cards, and paper napkins and fans for picnic parties. The department of publicity has made advertising contracts with approximately 200 weekly and daily newspapers in the towns and villages along its lines. Advertising copy is run when it is seasonable, and the amount varies with the different papers. In one of the accompanying illustrations are shown the various layout forms in which newspaper advertising appeared during the past year. Mats of these layouts were made for some newspapers and electrotypes were made for others, and the type matter was changed to suit the conditions existing in the different localities.

Newspaper advertising as well as publicity of all forms reaches its maximum just prior to the Illinois State Fair, which usually occurs in September. During the past two years the department of publicity has made it a special point to distribute the various forms of publicity in the territory served by the steam railroads which do not enter Springfield, Ill., the point where the

State fair is held. A considerable quantity of this advertising matter is distributed at the various county fairs held along these steam railroads, and during the present year either a representative of the company was sent or advertising matter was distributed at forty-six of these county fairs. This advertising sets forth the convenience of connecting with the Illinois Traction System trains at the various terminals, and the frequency, the safety and the comfortableness of the service.

In order to see that as many passengers as possible return from the State fair by way of the Illinois Traction System, a building has been erected on the fair grounds. This also serves as the official State fair bureau of information. The State fair association has a representative at this booth, as well as the Illinois



Parlor Car Service

IMPRINT ON PAPER NAPKIN GIVEN TO PICNIC PARTIES



MCKINLEY ELECTRIC BRIDGE

THE STRONGEST BRIDGE ACROSS THE MISSISSIPPI AND THE GREATEST ELECTRIC BRIDGE IN THE WORLD



STANDARD ELECTRIC LOCOMOTIVE AND FREIGHT TRAIN ON "THE ROAD OF GOOD SERVICE"

**You Really Sleep on 'Tracion Sleepers'**  
 EVERY NIGHT HEREIN  
 ST. LOUIS, SPRINGFIELD, PEORIA

Larger berths, windows in upper, safety-decked, vaults, electric light, electric fans, many other exclusive features.

**A Parlor Car Goes By**  
 ON "THE ROAD OF GOOD SERVICE"

Five chairs large. One car in platform, library, 200 ft. long, electric windows, club section smoking room, electric fans, electric light, electric fans, many other exclusive features.

St. Louis, Springfield, Peoria, Thebes, Union, St. Louis, Peoria

**the BEST WAY to the BEST STATE FAIR**

LOW RATES SPECIAL SERVICE VIA **Illinois Traction System**

PEORIA — MACHINAW — BLOOMINGTON (McKINLEY LINES) — LINCOLN — CLINTON — CHAMPAIGN — OGDEN — DANVILLE — URBANA — HOMER — CATLIN — BRIDGE PARK — SPRINGFIELD — DECATUR — MECHANICSBURG — CARLINVILLE — HILLSBORO — STANTON — EDWARDSVILLE — E-ST. LOUIS — ST. LOUIS

**Springfield, Sept. 15-23**

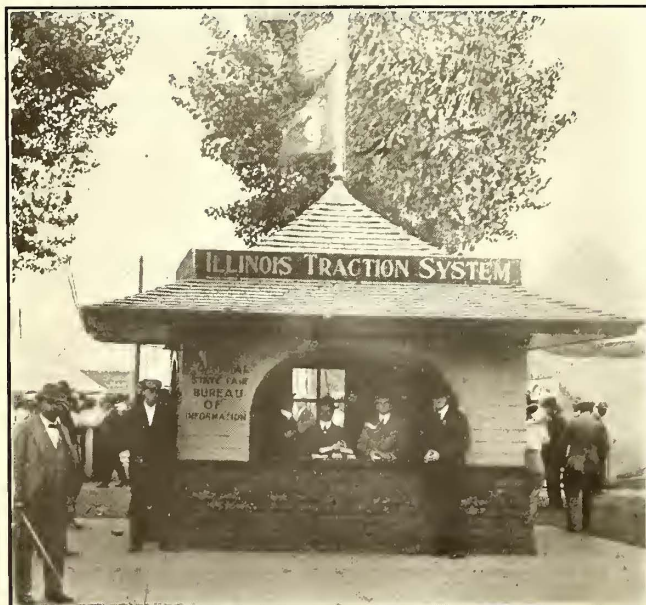
**CLIP THIS COUPON**

This Coupon when presented at the ILLINOIS TRACTION BUILDING on the State Fair grounds entitles the bearer to a free pocket railway map of Illinois.

ILLINOIS TRACTION SYSTEM PUBLICITY—HANDBILL ADVERTISING SPECIAL SERVICE TO STATE FAIR

Traction System, and information not only regarding the Illinois Traction System trains, but about all of the steam railroads and the fair itself is furnished upon inquiry. In connection with its newspaper advertising for the Illinois State Fair this year, the Illinois Traction System is offering to all those who will present a coupon, which appears in the advertisement, a souvenir consisting of a complete railroad map of Illinois showing the Illinois Traction System's lines printed in heavy red ink. Several of the various forms of publicity which are being used are shown in the accompanying illustrations.

This year a new set of illustrated postal cards was prepared by the department of publicity. These portray the sleeping and parlor cars, the freight trains, the McKinley electric bridge, the company's waiting station and substations, and the block signals. All ticket agents



ILLINOIS TRACTION SYSTEM PUBLICITY—INFORMATION BUREAU AT STATE FAIR GROUNDS

are furnished with a supply of these postal cards, and the fact that they may be had upon inquiry is announced in advertisements and upon posters. These illustrated postal cards are also distributed at the county fairs, they are supplied to the steam railroad ticket agents, and they are placed in the Illinois Traction System's parlor and sleeping cars. The last edition of cards was printed in quantities of 10,000 of each kind. Several years ago there was a great demand for them, but since the picture postal-card fad has passed the present demand for them is not so great.

Playing cards of two qualities and especially designed are also purchased by the department of publicity and distributed by the passenger department. One pack of these cards, which is of a 25-cent quality, sells for 15 cents, and the other, which sells for 25 cents, is of a 50-cent quality. These cards are sold at cost by all the ticket agents, and frequently when there is a special car movement producing considerable revenue, playing cards are furnished free to the passengers. The fact

**Low Rates—Special Service via Illinois Traction System**

To Springfield, Ill., Sept. 15-23

**TAKE THE TRACTION**

ILLINOIS TRACTION SYSTEM PUBLICITY—CAR CARD ADVERTISING SERVICE TO STATE FAIR

**ILLINOIS TRACTION SYSTEM**

IS PROTECTED BY **AUTOMATIC ELECTRIC BLOCK SIGNALS**

**AUCTION BRIDGE**

Declaration	♠	♣	♥	♦	Win. Rank Card	
Each Trick above 6	2	6	7	8	9	10
3 Honors	4	12	14	16	18	30
4 " "	8	24	28	32	36	47
4 " (Call to 1 hand)	16	48	56	64	72	100
5 " "	10	30	35	40	45	—
5 " (4 to 1 hand)	18	54	63	72	81	—
5 " (Call to 1 hand)	20	60	70	80	90	—

**Nullo 10, no Honors, Bid ranks below No Trump.**

Game is 30 points, rubber 200, grand slam 1000, a.m. 20. Nothing can be scored toward game except by the declarer's side. Honors are a mass scored as bid.

**TRAVEL IS SAFE ON THE "ROAD OF GOOD SERVICE"**

ILLINOIS TRACTION SYSTEM PUBLICITY—FACE OF EXTRA CARD AND BACK OF PLAYING CARD

that these playing cards are on sale at all passenger stations is advertised in the company's folder. There has been a large demand for them, because they are attractive and of excellent quality. Several extra cards are included in each deck, and on these is printed matter calling attention to the automatic block signals and the character and safety of the service. One of the extra cards contains a map of the road showing all the important stations. The back of the 15-cent playing card contains the Illinois Traction System's monogram on a conventional layout printed in red and gold. The back of the 25-cent playing card shows the rear end of one of the Illinois Traction System parlor cars printed in three colors.

# Observations of a Traveling Track Specialist

The Author States Some of the More Important Results of a Recent Inspection Trip to Several Doherty Properties

By A. SWARTZ

Vice-President Toledo & Western Railroad, Toledo, Ohio

IN the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 16, 1916, page 491, there appeared an article describing the work of the traveling specialists in the organization of Henry L. Doherty & Company. At the suggestion of the editors the writer has set down some results of his observations made during a recent trip as traveling track specialist for this company. No holding company, of course, operates a property with the expectation of allowing it to become a burden, but rather expects the property to maintain itself and earn some dividend for the holding company. This involves the standardization of methods and materials on the several properties operated by the holding company. Following the general policy of the Doherty interests to apply all possible methods for increasing the efficiency of their properties, the method described in the article referred to was developed. The general principle is not new, but as applied to electric street railway and interurban properties, it seems to possess some elements of novelty.

There is virtually no difference between the plan of using specialists to co-ordinate maintenance and operating methods of street railway properties and that which is carried on by any large steam railway system. A steam railroad is made up of a number of divisions maintained and operated by uniform methods except as these are modified to accommodate them to local conditions. Similarly the holding or operating company which controls electric railways in different parts of the country can standardize methods and materials with similar exceptions.

The holding company which absorbs a number of properties naturally falls heir to a variety of physical and operating conditions. With a systematic plan, however, it is in my opinion an easy matter to standardize with the aid of the experience of local managers. The opinions of these managers, without a comprehensive system, would result in great lack of uniformity.

In the Doherty organization the managers are frequently called in for consultation and are kept in close touch with the operating heads at New York, with excellent results for the local properties and the holding company itself. One can imagine that where a street railway is part of a local utility handling power, lighting, water and possibly gas, the manager cannot have time to go into the details of each department as thoroughly as he would like, and in some cases he does not have exceptional experts in charge of the departments. He is then pleased to have his property visited by men accustomed to specific classes of work, for to these he can refer the difficulties which they are especially qualified to rectify. The case is similar to that of the track foreman on a large steam railroad system who is delighted to have the roadmaster spend a few hours with him occasionally so that he can relieve himself of his troubles and get advice from one who really knows.

On a trip which I recently took for the Doherty interests I found many instances where reductions in

expenses could be secured, although there were others where increased expenditure seemed advisable in order to reduce future maintenance and operating costs. Some notes of observations on this trip are given below.

## TIE SPACING

At one point I found that 70-lb. T-rail had been used in concrete paving with steel I-beams placed 10 ft. center to center. The track was a solid structure of concrete from the top of the paving to the bottom of the foundation, which was 5 or 6 in. below the tie. The equipment used on this track was not very heavy, in fact, not over 1500 lb. per foot of track, so that the stress on rail and ties was not exceptional. The result of this extreme spacing of ties was seen in the unsatisfactory condition of the track at some points, although elsewhere it was holding up well, the tie rods, placed midway between ties, tending to maintain the gage.

On another property wooden ties with 7½-ft. spacing formed virtually the same construction as above. After having observed conditions in several locations with different tie spacing, I am practically ready to recommend that on the Doherty properties the tie spacing be increased to 3½ or 4 ft. between centers on small properties where light cars are used. This will result in a material saving on several properties.

I realize that this recommendation may elicit criticism, but many engineers will agree with me when they consider the small load per square foot and the low stress in the rail itself which are involved under the conditions mentioned.

It surely seems unreasonable that a street railway with a load seldom in excess of 2000 lb. per foot of track should use the same tie spacing as a steam road with a load of, say, 6000 lb. Why, therefore, cannot a street railway during reconstruction increase the tie spacing and save money? On one job in Toledo, one track was laid with ties on 3-ft. centers and the other was laid at the same time with ties on 2-ft. centers of standard construction having a concrete foundation. This track has been in use for four years and I see no evidence of unsatisfactory results with the greater spacing.

## THE LIFE OF TIES

As indicating the variety of conditions which the track specialist meets, I would say that on one property I found yellow pine ties being destroyed by dry rot in six or seven years. On another property oak ties were being bought at a lower price than yellow pine would have cost, on still another property oak ties were cheaper than on the one just mentioned, while on another property oak ties were more expensive. It is obvious then that, in standardizing a system as a whole, the purchase of ties should be left to the local managers.

I believe that more attention should be given to the use of creosoted ties even on small properties, for even if these cost 30 or 40 per cent more than good white oak ties, they will last enough longer to offset the extra cost and will also save by reducing track maintenance. A creosoted tie costing \$1 or \$1.10 will last

eighteen or twenty years in open track, providing care is taken to keep excess moisture away from it. A good oak tie, costing 60 or 70 cents will, under the same conditions, probably last eight or ten years. My observation leads me to believe that creosoted ties in pavement may last thirty years.

#### THE MATTER OF BALLAST

A great many properties have cheap ballast right at their own doors and can save money by using it. On one property which I visited, in the coal mining district, piles of shale which, as the accumulation of years, provided a natural source of ballast at little cost to the railway. This forms an excellent ballast, furnishing good drainage. I noted the tendency of small railways not to make the proper use of cinder ballast for track foundation, but to allow the track to be maintained on ordinary soil. Power house cinders, which are usually sold for less than their value or are not used at all, could have been used here to improve very greatly the riding qualities of the track. I strongly believe in the use of good cinders under ties and especially on open track in the outskirts of cities or on interurban systems. Continued use will eventually make a good sub-grade and the finest kind of foundation for stone ballast.

One company visited was crushing its own stone ballast and was furnishing local contractors with crushed stone for concrete work. A small plant for this purpose often brings in a good revenue.

#### PROPER DEPTH FOR PAVING BRICK

On some properties I found that 60-lb. A. S. C. E. rail was being used with brick pavement in which the bricks were 4 in. deep. The result was not satisfactory, for the paving will necessarily sink somewhat between ties, leaving those on the ties higher than the balance. The track had a crown of about an inch and vitrified clay nose blocks were used against the T-rail. The blocks, however, were too short and the flange or nose of the block was so shaped that vehicular traffic very readily kicked them up. At a number of points these difficulties had been remedied by the use of paving bricks 3 in. deep, which were very satisfactory.

#### TRACK DRAINAGE

On one property very poor drainage conditions were found, in fact, I believe the worst I ever saw. The roadway was of a very sticky clay composition, so that after every rain the sub-grade became a mere mud puddle. The difficulty had been partly remedied by using ballast made by breaking up vitrified retorts from a smelting plant. These were broken up in small pieces, not as small as they should have been for the best results, as some were as large as 5 or 6 in. across and 2 in. thick; however, when this ballast was applied to the roadbed and well tamped under the ties and filled up to the top of the tie it drained away the moisture in a surprising manner. While the broken retort material was of a spongy character and had a tendency to absorb water, it did allow the rainfall to get away from the track. An objection to the use of such large pieces was that when the ties are to be renewed it will be costly to replace them. I suggested, therefore, that the material be broken up smaller. This ballast was used principally on an interurban system, although some city track was similarly ballasted. The unsightliness of the ballast was, of course, against its use in the city.

The importance of good drainage is illustrated from the experience of the Lake Shore & Michigan Southern Railway, the track of which owes a great deal of its

perfect riding qualities to the attention paid to drainage.

#### SINGLE-TRUCK CARS AND TRACK MAINTENANCE

On a number of properties I attributed the high maintenance charges per track to the use of single-truck cars. Unless such are especially built to overcome teetering, criticism from the public will be incurred even though to the casual observer the track is in fair condition as to surface. The result is that the track forces have to put a great deal of work on the track which would not be necessary with double-truck cars.

In selecting types of single-truck cars managers will have to consider this question carefully. I realize that it costs more to haul a double-truck car on account of the excess weight, but I am of the opinion that the increased wear and tear on the equipment and the increased (esthetic) track maintenance will go a long way toward offsetting the increased haulage charge. I realize that this statement may bring a storm about my ears and I hope that it does. I believe that it is a matter which, in our anxiety to reduce operating costs for transportation, has worked to the detriment of the maintenance department.

#### STANDARDIZING PURCHASES AND STORE ROOMS

One of the main purposes in the investigation recently made was an attempt to standardize the use of materials and to centralize the purchasing and storing of them at a fairly central location. This would eliminate the stock accounts of the several companies to quite an extent, save in the original purchase prices, and assure prompt delivery. It frequently occurs on small properties that when certain work is to be done the proper material is not available and it may be difficult to secure prompt delivery. Makeshifts are sometimes adopted instead of the proper materials, and the work must soon be done over again. Centralizing a store room should to a great extent prevent this.

In addition, it often happens that small companies must pay premiums on their supplies because they cannot buy in large enough quantities to get reasonable prices. This applies to rail, bars, spikes, bolts, special work, etc. There is no reason why special work cannot be standardized with, say, three or four typical types of construction for different layouts. An example of what can be done is seen in Detroit, Mich., where standardization has saved the railroad company a great deal of money. I expect to recommend to our company a system of standardization for all departments of our property and believe that a material saving must result.

### A Co-operative Safety Advertising Campaign

By Working Together, Public Utilities, Manufacturers and a Leading Newspaper of Beaver Falls, Pa., Financed an Effective Publicity Undertaking

THERE was recently concluded in the city of Beaver Falls, Pa., which has a population of slightly more than 12,000 inhabitants, a safety publicity campaign which may prove suggestive to other communities. It was initiated by W. H. Boyce, superintendent Beaver Valley Traction Company, who proposed to the three local newspapers an advertising campaign to be jointly financed by the manufacturers and public service companies of the Beaver Valley.

The suggestion of Mr. Boyce appealed to the *Evening Tribune*, which put a solicitor into the field to explain the proposition to the companies and to collect the

necessary funds. The *Tribune* has a daily circulation of about 5500 copies and it is widely distributed throughout Beaver County and in fact, throughout the western part of Pennsylvania. Sums varying between \$25 and \$100 were secured, the amount depending upon the number of employees of the subscriber. Sufficient money, about \$900, was secured to provide for the publishing of twenty full-page advertisements and these appeared on Saturdays during the past spring and early summer. A sample of the advertisements are reproduced herewith. Some of them contain very much more text than the one illustrated, the type being too small for reproduction on a small scale.

The first advertisement announced the inauguration of the campaign, advocating common-sense care in the

SAFETY ADVERTISEMENT NUMBER FIFTEEN

**Start NOW to Practice**  
**"SAFETY FIRST"**

~~~~~

**You're Enjoying Good Health**  
--That's Pleasant

**You Want to Remain So**  
--That's Natural

**You May Be Careless**  
--That's Possible

**You May Have An Accident**  
--That's Probable

**You Sincerely Hope Not**  
--That's Evident

**Then Practice "Safety First"**  
--That's Wisdom

SAMPLE SAFETY NEWSPAPER ADVERTISEMENT IN RECENT  
BEAVER VALLEY CAMPAIGN INAUGURATED BY  
LOCAL ELECTRIC RAILWAYS

prevention of accidents and urging the close observance of simple safety rules at all times. It was stated that the one object of the campaign was to be to prevent accidents and deaths due to accidental causes. The manifesto was signed by the Beaver Valley Traction Company; the Pittsburgh, Harmony, Butler & New Castle Railway; the Penn Bridge Company, and more than a dozen other manufacturers.

In addition to running the advertising copy in the *Evening Tribune*, it was reproduced on cardboard each week and 200 copies were distributed pro rata among the subscribers to the campaign. These cards were posted prominently throughout the shops, carhouses, etc., and served effectively to reinforce the newspaper publicity.

The Kansas City (Mo.) Railways Company is putting twenty snow sweepers through the shops. The vestibules of these sweepers are being inclosed and the heaters rearranged so that they will be of more service in keeping the motorman warm.

## B. R. T. Employees Complete Organization

THE employees of the Brooklyn (N. Y.) Rapid Transit Company on Sept. 28 completed the organization of their independent union by altering the by-laws of the Employees' Benefit Association, which had been in existence for sixteen years, so as to provide for the election of a group of departmental trustees. These men, in accordance with the plan described in the *ELECTRIC RAILWAY JOURNAL* of Aug. 12 and Sept. 2, are to be spokesmen for the men of each department and present any grievances they may have to their superiors. The unanimity with which the alteration was accepted by the men was shown by the fact that before the meeting 9812 out of the total 10,200 employees in the association had voted by proxy in favor of the amendment. The 3000 men at the meeting voted as one man in favor of the amendment. In speaking to the men President Williams said in part:

"In taking this last formal step in a program of co-operation, we are merely strengthening the ties of mutual confidence which have long held us together. We are not merely adding safeguards to the protection of our mutual interests. We are not celebrating merely a local achievement. We are making a notable contribution to industrial and corporate history. We are demonstrating to Greater New York and to the world that many thousand men—joint workers in a great enterprise—can, when imbued with a common impulse and animated by an intelligent purpose, settle their own difficulties and look out for their own concerns without any dictation or interference from non-resident or resident busybodies.

"We are demonstrating to society that transportation need not be paralyzed at the whim of any small group of mischief-makers. We are proving conspicuously and conclusively that the forestalling, or adjustment of causes of discontent which always attach to working conditions, require no new laws, no official orders, no public investigations, no outside arbitrations. We are necessarily diminishing the opportunities for making a living to many agitators in politics, in labor circles and among social reformers, but there is still room left for all these in respectable and helpful employments, even if such new occupations be less remunerative and require harder labor. We are giving notice, especially to certain residents of Detroit, Troy and Boston, who have sought to disturb our peace, that in our working organization we have brains enough, and the disposition, to manage our own local affairs according to our own ideals and opportunities."

After referring to his thankfulness that the loyalty of the employees had been proved true in spite of the Amalgamated Association organizers in other parts of New York, President Williams continued:

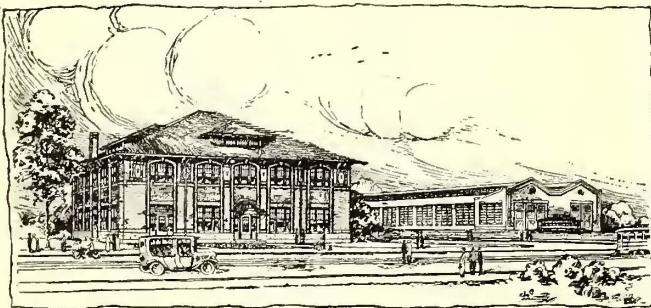
"You perhaps do not know how much interest has been taken throughout the country in your attitude during the disturbing times of the past three months. There have been many inquiries from individuals and some from public service corporations as to how it happened that with practically all the street railway employees of Greater New York on strike, the men on the Brooklyn cars have remained loyal and have refused to allow the public to be inconvenienced by interruptions to service; and from some inquirers have come requests for copies of your association's new by-laws. While there were other contributing causes, the main reason, and the fundamental one, why our men have remained true is because we trusted them and they trusted us. This mutual confidence is the solid structure which years of close relations have built up. It makes no dif-

ference what wages are paid, what hours are required, what other conditions or privileges of employment prevail, if there is no reciprocal belief in sincerity of purpose there can be no sound foundation for industrial peace. If you are convinced that your company's management is sincere in its attitude toward you and will share its prosperity with you as it is able, you would not be real men if you did not stand by your company when it needed you. And, on the other hand, if your company believes in your loyalty toward it, it would indeed be a mismanaged company if it did not do the best it could for you. We have both met the test—and our mutual respect and confidence were never greater than they are to-night.

"The action which your association has taken has strengthened our old relations by supplying a better opportunity for exchanging ideas not only as to conditions surrounding employment but as to other interests of the company. I feel sure that we have entered upon a new era in our relations which will greatly promote our ambition for a model public service corporation. We cannot separate or get very far from each other if we all adhere to the principle which has animated us in the past—square dealing among ourselves and the success of the company. There always will be among men differences of opinion, but I have found that nothing scatters differences so quickly among intelligent and honest-minded men as frank discussion of facts. The disposition to be fair has been amply demonstrated in the past—the opportunity for full information on which to base conclusions is now furnished by the representation which each department will have in company councils."

## \$65,000 Buildings for Detroit United

THE office building and carhouse shown in the accompanying reproduction from the architect's drawing are under construction for the Detroit United Railway at West Jefferson Avenue and Mecca Street. These were mentioned briefly in the news columns of last week's issue of the *ELECTRIC RAILWAY JOURNAL*. The office building is to be of pressed brick and its dimensions are 64 ft. wide by 70 ft. deep. On the lower floor



NEW CARHOUSE AND OFFICE BUILDING FOR DETROIT UNITED RAILWAY

will be offices for the line superintendent, carhouse foreman and cashier, an assembly room for motormen and conductors, and a rest room for employees. The second floor will be used for a locker room and dormitory for the night crews.

The carhouse, which will take care of Fort, Grand Belt, Springwells and Wyandotte-Trenton cars, will replace the carhouse located at Fort Street and Clark Avenue. It will be of brick, 209 ft. deep by 116 ft. wide and will house twelve cars in the pithouse and eight cars in the washhouse. It will also contain a boiler room, compressor room, employees' wash and locker rooms and a stock room. The total expenditure on the two buildings will be more than \$65,000.

## Setting Power Service Standards

ALL electric railways that sell power will have to face, sooner or later, the problem of meeting the standards of power service set by a regulative body of some form or other. Circular No. 56, "Standards for Electric Service," recently published by the Bureau of Standards, contains much, therefore, that should be of interest to electric railway men. In this "circular," which is a paper-bound volume of 259 pages, the bureau presents a survey of the general field of State and municipal regulations relative to standards for electric service, and suggests rules and ordinances which may form the bases of future commission regulative codes and town or city ordinances.

The results of the survey are described under seven main headings, namely: The adequacy and safety of electric service; meters and instruments; standardizing laboratories of State public service commissions; rules and regulations for electric service as adopted by State commissions; suggested rules for the regulation of electric service by State commissions; the regulation of electric service by city ordinance; suggested ordinances for the regulation of electric service in towns and cities. Also, various summaries and tabulations are given in the several appendixes.

In an analysis of the various factors which affect the adequacy and efficiency of electric service it is pointed out that these matters are determined very largely by three general sets of conditions. These conditions are specified as: Central station operation; the transmission and distribution system; the energy translating and metering devices. The questions of voltage variations on lighting and power circuits, the interruptions of service, the frequency of alternation on alternating-current circuits, the accuracy of watt-hour and other meters, the efficiency of lamps, motors, and other energy translating devices are given as factors which affect the adequacy of service.

The rules and regulations for electric service as adopted by the various State commissions have been collated under some thirty-five different headings. Some of the factors named in the preceding paragraph form the headings which are of most interest to railway men. According to the tabulation of rules on the subject of voltage regulation, the permissible variations range from 3 per cent above or below to 10 per cent above or below the standard. Five per cent variation either way from normal seems to be the common permissible frequency variation. Permissible meter errors range from 1 per cent to 4 per cent. These percentages of error apply to both light and heavy load conditions.

In the model rules and regulations which the bureau has drawn up to assist in the future guidance of State commissions, the permissible voltage variations for several different classes of service are specified. For lighting service it is specified that the voltage shall be within 5 per cent plus or minus of the standard adopted, and the total variation of voltage from minimum to maximum shall not exceed 6 per cent of the average voltage in cities and other incorporated places having a population in excess of 2500, nor 8 per cent of the average voltage in all other places. For power purposes a voltage variation not exceeding 10 per cent plus or minus is specified. The permissible frequency variations are the same as given above. The maximum permissible meter errors are plus 2 or minus 4 per cent at light load and plus or minus 2 per cent at heavy load.

Copies of this circular may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 45 cents per copy.



## Damages and Accident Prevention at Boston

There Has Been a Marked Increase in the Burdens Imposed on the Company by Legislative Accident Enactment, Judicial Interpretations and Jury Verdicts

IN connection with the investigation of the finances of the Boston (Mass.) Elevated Railway, now being conducted by a special recess commission of the Massachusetts Legislature, an interesting analysis of the trend of damage payments for injuries has been prepared by Russel A. Sears, general attorney for the company. The causes of increased payments for injuries in the face of the company's well-known safety record and continuous efforts to avoid accidents of every kind are discussed in Mr. Sears' statement with great clearness and indicate the difficult problem ahead of the company's legal department. An abstract of Mr. Sears' analysis is printed below.

The solicitation of accident cases had hardly more than started in 1897, when the Boston Elevated Railway leased the West End Street Railway. At that time the law of negligence relating to carriers of passengers was more favorable to the carriers than to travelers on the highway and very frequently more favorable than to the passengers on its cars. Since then many changes have taken place, nearly all of which have operated to the disadvantage of the railway, and it has only been through great effort that the company has been able to hold its outlays for legal expense down to the ratios that it has. In order to show the conditions surrounding the legal department compared with former years, the calendar years 1913 to 1915 inclusive have been compared with 1910 and 1911, omitting 1912 on account of abnormal conditions associated with the strike of that year. Practically the same officials have been in charge of the department for these years and there has been no permanent important change of policy, in general.

The principal burdens which the company has been called upon to bear are:

1. Adverse legislation.
2. Liberal construction of the law by the Supreme Court toward claimants.
3. Liberality of juries.
4. Reluctance of justices of the trial courts to set aside what may be considered excessive verdicts and in taking away cases from the jury for want of evidence of negligence.
5. Increase in the number of claims and suits resulting from the foregoing.

### ADVERSE LEGISLATION

The Legislature of 1910 declared that a sign or any other warning prohibiting a passenger from riding on the front platform or warning him that such riding was at his own risk should not constitute a defense. The designation of certain doors in rapid transit cars as "In" and "Out" was declared no defense for the company in 1911, and in 1907 the Legislature increased the amount recoverable in case of death caused by the railway to \$10,000 and no longer permitted the maximum to be levied only in case of gross negligence on the part of the company. Up to 1914 there was no presumption in favor of a traveler on the highway that he was in the exercise of due care at the time he sustained the injury. In that year a statute was enacted which throws on the defendant the burden of proving that due care had been exercised.

During the past few years the Supreme Court has

greatly liberalized the law toward persons injured by a railway. Before 1911 a traveler on the highway who was struck by the car of a street railway company had little or no chance of recovering damages, but now practically all such cases are questions for the jury and in this item alone the company pays approximately \$50,000 more per year than before decisions of the court which have completely changed the course of such cases. Until recently, a person who fell in a street car while it was being started, even though the start were violent, had no case, but now if the plaintiff has a firm hold broken, the case goes to the jury, and even this theory is unnecessary if the plaintiff produces an expert prepared to testify that the car could not start unless through a defect in the equipment or negligent operation.

Collisions between cars and vehicles are now nearly all cases for the jury, whereas three or four years ago they were frequently taken away on account of lack of care on the part of the plaintiff. The Supreme Court has also decided that even two or three persons around a car might constitute a "crowd," in connection with cases of pushing passengers into spaces between platforms and cars.

As important as these decisions were in increasing the legal expenses of the company there has been little or no help through favorable decisions during these years.

### LIBERALITY OF JURIES

The juries, particularly in Suffolk County (containing Boston proper) where the great majority of the company's cases are tried, have never been so liberal as in the past two or three years—and they never were stingy. The average of plaintiffs' verdicts from September, 1906, to June, 1911, inclusive, was \$1,062.36, and from September, 1911 to June, 1916, inclusive, \$1,438.58, an increase of 39.5 per cent. The average of all verdicts plaintiffs, defendant and non-suits, for the court trial years from September, 1906, to June, 1911, inclusive, was \$352.45 compared with \$575.28 in the later period, an increase of 63.3 per cent. The personnel of the juries is not improving; not only this, but the fact that a higher standard of prices in commodities and wages prevails in the industrial world, has been an element in the cause of the increase in the verdicts. Again, there is reason to believe that the theory of the Workingmen's Compensation act, in so far as it provides compensation whether there has been negligence or not on the part of the company, is to some extent wrongfully applied to passengers and to non-passengers in litigated cases where personal injuries have been sustained.

### PRACTICE IN TRIAL COURTS

The justices of the Superior Court, before whom the cases are tried by the juries, have been more reluctant to take plaintiffs' cases away from the jury on account of insufficiency of evidence during the past three years than formerly, as is also the case in setting aside verdicts for the plaintiffs which may fairly be considered excessive. It is believed that the recent agitation concerning the recall and election of judges has played some part in this situation.

### INCREASE OF CLAIMS AND SUITS

These legislative acts and court decisions have led to an increase in the number of claims and suits and to corresponding increases in payment for suits; and although in the period taken for comparison there has been a decrease of 9.5 per cent in the number of accident reports received by the company, there has been at the same time a large increase in the number of

claims and suits and the payments required to adjust them as shown in the following tables:

| PASSENGER ACCIDENTS                               |                                 |                              |                      |                      |
|---------------------------------------------------|---------------------------------|------------------------------|----------------------|----------------------|
|                                                   | Calendar<br>Years<br>1913-14-15 | Calendar<br>Years<br>1910-11 | Per Cent<br>Increase | Per Cent<br>Decrease |
| Total number reports received                     | 9,697                           | 10,701                       | ...                  | 9.5                  |
| Reports per million car miles                     | 212                             | 238                          | ...                  | 10.9                 |
| Reports per ten million passengers carried        | 355                             | 422                          | ...                  | 15.8                 |
| Total number claims and suits settled             | 4,537                           | 3,666                        | 23.7                 | ...                  |
| Number settled per million car miles              | 99                              | 85                           | 22.2                 | ...                  |
| Number settled per ten million passengers carried | 166                             | 145                          | 14.4                 | ...                  |
| Total amount paid in settlement                   | \$398,792                       | \$305,996                    | 30.3                 | ...                  |
| Amount paid per million car miles                 | 8,705                           | 6,796                        | 21.9                 | ...                  |
| Amount paid per ten million passengers carried    | 14,618                          | 12,183                       | 20                   | ...                  |

| NON-PASSENGER ACCIDENTS               |                                |                             |                              |                              |
|---------------------------------------|--------------------------------|-----------------------------|------------------------------|------------------------------|
|                                       | Calendar<br>Year<br>1913-14-15 | Calendar<br>Year<br>1910-11 | Per Cent<br>Average Increase | Per Cent<br>Average Decrease |
| Total number reports received         | 5,850                          | 5,942                       | ...                          | 1.6                          |
| Total number claims and suits settled | 1,906                          | 1,238                       | 53.9                         | ...                          |
| Total amount paid                     | \$242,962                      | \$129,948                   | 57                           | ...                          |

| RAPID TRANSIT LINES    |                       |                    |                      |
|------------------------|-----------------------|--------------------|----------------------|
|                        | 1913-14-15<br>Average | 1910-11<br>Average | Per Cent<br>Increase |
| Total reports received | 3,861                 | 3,174              | 21.6*                |
| Total claims settled   | 967                   | 609                | 58.5                 |
| Total amount paid      | \$59,420              | \$53,535           | 11                   |

\*Cambridge subway opened March 23, 1912.

In noting the above data, it may be emphasized that the office expenses of the legal department have for the fiscal years 1909, 1910 and 1911, as compared with 1914, 1915 and 1916, shown a decrease of 14 per cent.

Before the passage of the Workingmen's Compensation act and its adoption by the company, the expense to which the company was put by reason of the suits brought, claims made and gratuities paid its employees was about \$11,000 a year. Since the adoption of the act the cost to the company has been in 1912, \$56,212.60; in 1913, \$56,455.24; in 1914, \$78,994.60; and 1915 will be about the same as 1914. These figures do not include the company's extra clerical assistance.

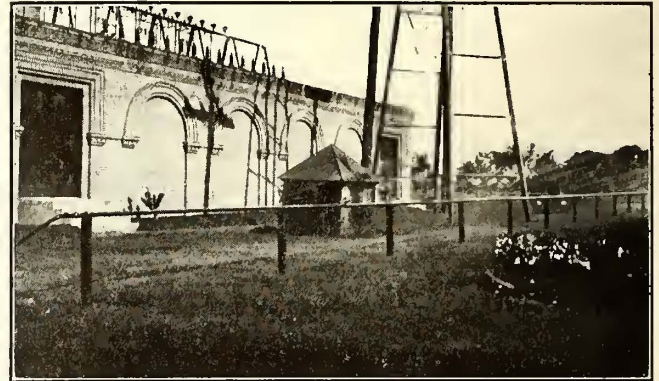
Notwithstanding the burdens placed upon it the Boston Elevated Railway was the first street railway in the country to win the Brady prize. In spite of the distinction conferred upon the company by the award of this medal—the award really meaning to designate that this road stood in the lead of all others in America in safety work, and in spite of the fact that new and improved methods in handling its accident claims, office economies and the adoption of nearly all that is modern and approved in the line of accident prevention, the Boston Elevated has paid nearly as large a percentage of its passenger revenue in recent years as did the West End Street Railway in the last two years of its existence as an operating company. The average for the West End in 1896 and 1897 was 4.05 per cent and for the Boston Elevated in 1915 and 1916 was 3.65 per cent.

With the foregoing conditions surrounding the company—and which are not likely to change to its advantage—with the tremendous increase in traffic in the coming years in a city physically ill-adapted to digest it, with the necessary high standard of safe operation and an ever-exacting traveling public, it appears that the Legal Department has some difficulties to face in the future.

J. H. Wheelwright, president of the Consolidation Coal Company, has offered prizes of \$1000, \$750 and \$300 to boards of trade of cities and towns in territory served by the Monongahela Valley Traction Company, Fairmont, W. Va., for securing during the coming year new industrial establishments.

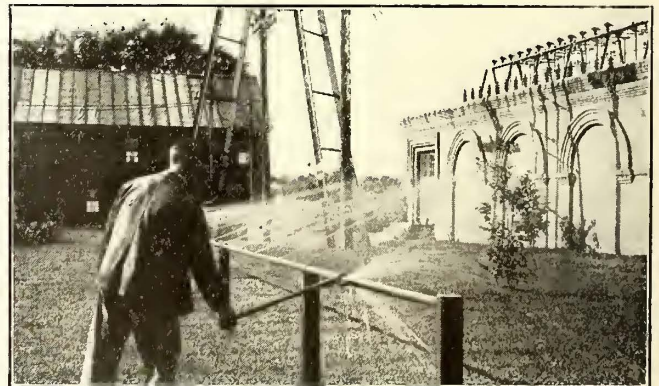
## Home-Made Sprinkler for Power Station Lawn

At the Millbury (Mass.) plant of the Worcester Consolidated Street Railway, a convenient lawn sprinkler has been assembled by mounting a number of sections of 1¼-in. pipe on wooden posts about 3 ft. above the ground, connecting the pipe with a pump discharge in the adjacent plant and drilling needle orifices in small brass plugs inserted in the pipe every 30 in. Water is



HOME-MADE LAWN SPRINKLER MADE OF 1¼-IN. PIPE SECTIONS

supplied at a pressure of 80 lb. per square inch, and a 2-ft. pipe-handle at one end of the line, which is about 125 ft. long, enables the nozzles to be rotated through an arc of over 180 deg. As shown in the accompanying photographs of the pipe line, the resulting sprays can



VIEW SHOWING METHOD OF ROTATING SPRINKLER PIPE

be adjusted for maximum, minimum or intermediate range with the utmost ease. The pipe line is supported on 3-in. by 4-in. uprights, and at one end a coupling permits the addition of a standard portable sprinkler line.

## New Car Signs for St. Louis

The United Railways of St. Louis, Mo., have installed enameled plates about 5 in. square, bearing numbers, on the front dashboards of their cars. These numbers are for the guidance of road officers and are used to designate the car's place on the time schedule, but do not correspond with those painted on the cars. The cars on each line are numbered consecutively. This new system is expected to make it easier to straighten out traffic tangles after blockades or accidents. Supervisors placed in different parts of the city can identify the cars by the numbers and can tell at a glance the time schedule and routing of any car. In trying out this system a check will be kept on each car.

## Why Toledo Railway Decided on Train Operation

Reasons for Selection of Two-Car Units and of Two Cars Rather Than a Motor Car and a Trailer Are Given

IN an article on the subject of train control appearing in the current issue of the *Electric Journal*, C. A. Brown, master mechanic Toledo Railways & Light Company, Toledo, Ohio, describes the control equipment used on the two-car trains and discusses the considerations leading to the adoption of this type of equipment. After experimenting with rolling stock borrowed from other properties it was decided that two-car units would be desirable particularly in handling crowds from the factories and from the downtown districts in rush hours. The economy in crew expense thus made possible was also a consideration.

In considering the relative merits of a motor car with trailer versus two-motor cars, the following points were brought out:

1. The motor car and trailer form of train unit first considered would give the necessary additional rush-hour seating capacity for the minimum first cost. The additional cost of a two-car multiple-unit train, as compared with the motor car and trailer unit, would be about \$850, or \$425 per car, for the particular type of equipment considered.

2. This two-car train unit, however, could be efficiently used only during morning and evening rush hours, and on holidays or other special occasions. The combined seating capacity of motor car and trailer would be about 110 people, which would ordinarily be much greater than the traffic requires. Therefore, during a large part of the day the trailer car, representing about 37 per cent of the first cost of the train unit, would lie idle in the barn.

3. During the non-rush hour part of the day it would be necessary to keep in service, on certain lines in the city, rolling stock that was comparatively expensive to operate, while half of the new cars, being trailers, could not be used economically.

4. On Sundays and special occasions during the summer the traffic on some of the suburban lines, particularly the Toledo Beach line (13 miles long), becomes so heavy that it is necessary to supplement the regular suburban equipment with some of the regular city cars. As the line is single track it sometimes happens that as many as four or five cars follow one another from siding to siding and, aside from the element of risk, there is a considerable delay at sidings awaiting for the last car to come up. This situation would be considerably improved by even partial multiple operation of trains of three to five cars.

5. Trailer operation involves four-motor equipment of such capacity that the most economical type of motor, the field-control type, could not be used unless the more expensive remote control were purchased. This was because no K controller of a suitable type had as yet been developed. The economy of field control in the Toledo service had been demonstrated by a sample equipment placed in service in 1914. Careful tests showed a saving in power of approximately 17 per cent compared to the non-field-control equipment, with both equipments geared to give about the same free running speed. This large saving might not be obtained on the new cars, but it was estimated that the saving in power due to field control would be at least 7 per cent.

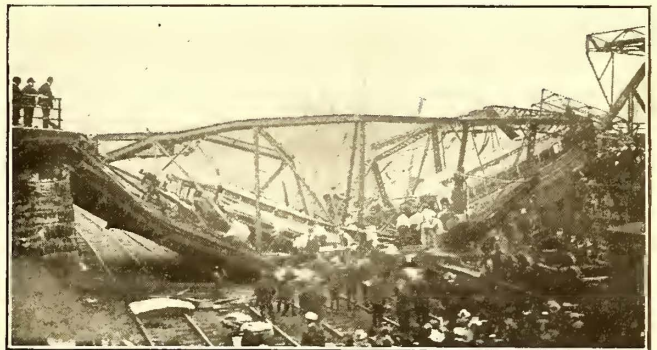
6. The combined weights of the motor car and the trailer would be less than that of the two-car multiple-unit train, but the weight of the single car with two motor's would be less than that of the car equipped with four motors for hauling the trailer. Therefore, if

two-car train operation were realized 100 per cent of the time, the motor car and trailer would have the better weight economy, but any mileage made by the four-motor car operating along would require additional power as compared to operating the two-motor car.

A careful study of these different factors led to the conclusion that the relative economy of the motor car and trailer as compared with the two self-propelled units depended altogether upon the percentage of time two-car operations would obtain. It was estimated that out of a working day of sixteen hours there would be about six hours during which two-car trains might be operated economically. With this as a basis, a comparison was made of the power consumption of motor cars and trailers versus motor cars. It was assumed that the new motor cars would be operated all day, and that in one case the trailers would be withdrawn during non-rush hours, and in the other case the two-car multiple-unit train would be broken up into twice as many one-car trains and some of the older equipment could be sent to the barn. It was estimated that under these latter conditions the saving in power alone would just about offset the additional fixed charges for the double-motor train control equipments, and this, together with the savings in maintenance and the operating and other advantages mentioned, were considered important enough to justify the investment.

## Railway Accident on Cleveland, Ohio, Bridge

THE accompanying illustration tells part of the story of an accident which occurred at 5.15 p. m., Oct. 3, 1916, on the lower West Third Street Bridge in Cleveland, Ohio. A runaway Scranton Road car jumped the track at the approach to the bridge, crashed into two posts and precipitated the span to the B. & O. Railroad tracks 23 ft. below. A second car entered the span as



BRIDGE SPAN IN CLEVELAND (OHIO) COLLAPSED BY RUNAWAY CAR

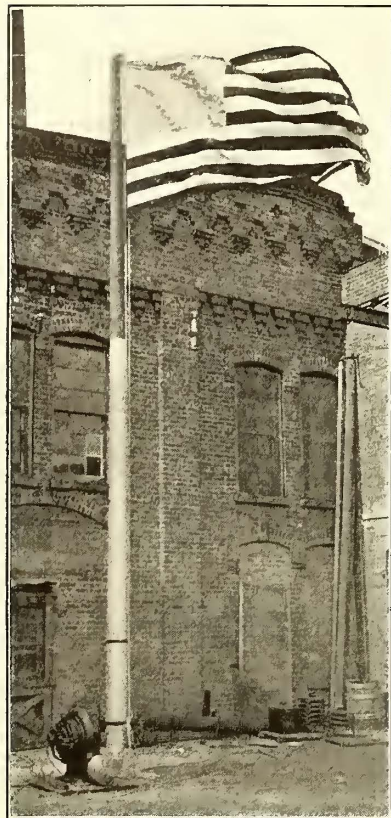
it was sinking, and went down with it. The bridge lies at the foot of a long, steep grade, and there is a short but sharp curve at the entrance to the span.

The span that gave way is of the through truss type, 105 ft. long and 32 ft. 6 in. wide, and constructed of wrought iron. It was erected in 1888, and is somewhat corroded; but it is said that the engineers of the railway and the city agree that probably even a new bridge could not have withstood the impact, although a plate girder bridge might have stood up. In the accident two persons were killed and a number were injured.

The Kansas City (Mo.) Railways are installing folding steps and rear doors which fold outwardly on the "900" type of cars, which are the last type to be so equipped. Automatic door signals, for the use of the motorman in signaling the conductor of approach to a stop are also being installed on all the cars.

## A Self-Waving Flag

THE pneumatic flag-pole and flag shown in the accompanying illustration was designed and constructed under the direction of the illuminating engineering



SELF-WAVING FLAG EQUIPMENT DESIGNED FOR ATLANTIC CITY CONVENTION

laboratory of the General Electric Company for the Atlantic City convention exhibit. The cut shows the equipment as temporarily erected in a yard at the factory and without a large bronze ball in which the pole will terminate.

The pole is a metal tube 27 ft. high, and 5 in. in diameter at the top and 9 in. at the bottom. It is set over the exhaust port of a 2-hp. electric motor-driven blower, to be inclosed in a wood box having at one end a section built up as a supporting guide for the mast. The base will be surrounded with foliage to make it appear to set solidly in the ground. The principal section of this hollow flag-pole was originally part of the mast of the

steamship *Clermont*, the skeleton of which was used at the Hudson-Fulton celebration in 1909.

For a distance of 9 ft. from the top of the pole it is perforated with two rows of  $\frac{1}{2}$ -in. holes drilled  $1\frac{1}{2}$  in. apart. When the blower is in operation the blasts emitted through these holes hold the flag and impart to it the waving motion suggested in the illustration.

## Standardization of Line Construction in California

THE Railroad Commission of California has issued fifty-eight orders to electric and telephone corporations looking to the safety of human life by the standardization of electric and telephone transmission system construction, and involving the spending of more than \$750,000 to this end. The orders took the form of authority for extensions of time within which these public utilities may comply with Chapter 499 of the laws of 1911, as amended by Chapter 600 of the laws of 1915 referring to the placing, erection, use and maintenance of electric poles, wires, cables and appliances.

The Legislature passed this act for the purpose of removing the danger to employees engaged in the construction, reconstruction, maintenance and use of such property, and of the general public. The statute provided that it become effective six months from the date of its passage in so far as it relates to new work, and that five years should be allowed for the rebuilding of existing work to meet the provisions of the law. The Legislature in 1915 amended its previous act, and vested in the Railroad Commission the authority at its discre-

tion to grant additional time to corporations, and instructed it to pass on all work done.

The commission's order names specifically the period within which each utility must do a third and also two-thirds and the entire work, which last must be completed before June 30, 1919. All the companies are to report to the commission from time to time as ordered upon the progress of the changes. The orders direct the companies to proceed with the work as rapidly as possible, and vary in length of extensions granted according to the conditions under which the utility operates.

## Colorado Association Discusses Investments and Regulation

THE fourteenth annual convention of the Colorado Electric Light, Power & Railway Association held at Glenwood Springs, from Sept. 21 to 23, was the largest in the association's history. In his presidential address John J. Cooper of Denver outlined some of the work of the past year. The papers of particular interest to electric railway managers were the following:

The first paper, "Utility Investments," by W. C. Sterne, president of the Municipal Properties Investment Company, Denver, called attention to the fact that the day is past when the public gives little study to its investments. Among the important things which the present-day investor wants to know are: The efficiency of management at the time of investment, dangers of differences with municipalities and of labor and wage difficulties, variations in prices of materials, the extent of rate and service regulations, an accurate forecast of depreciation elements, the effect of management changes, effect of periods of business depression on earnings, character and plane of political activity, financial plan upon which the utility is to be or has been established, and marketability of its securities.

The paper on "Customer Ownership," by William H. Hodge, manager of the publicity department of H. M. Bylesby & Company, Chicago, covered the matter of inducing consumers of a public utility to become financial partners in the enterprise and dealt with the experimental plan initiated to sell utility stock to utility customers in cities and towns served by the Northern States Power Company.

M. H. Aylsworth, chairman of the Colorado commission, speaking on "Utility Regulation," reviewed several recent decisions of the Supreme Court of Colorado which directly affect public utilities. One of these, wherein the court held that no state court can interfere with the public utility commission in its decisions under the act, he declared is of vital importance.

On Saturday F. W. Herbert, statistician of the Colorado commission, opened the proceedings with a paper on "Depreciation Accounts," which excited considerable discussion. The depreciation account of the utility should show in detail the "build-up" of the depreciation reserve so it may be prepared to give a correct analysis of the charges and credits to this reserve. The distinction between repairs and replacements, said Mr. Herbert, or items that should be charged to maintenance or reserves, must be determined for each individual case. He favored charging all repairs and minor replacements to the operating expense accounts and providing in the reserve for replacement of major units only.

A paper, "Tell the Public What You're Doing," by S. J. Ballinger, advertising manager of the Trinidad (Col.) Electric Transmission, Railway & Gas Company, could be epitomized in the sentence, "Tell them everything."

**COMMUNICATIONS**

**Interurban Future Never Brighter**

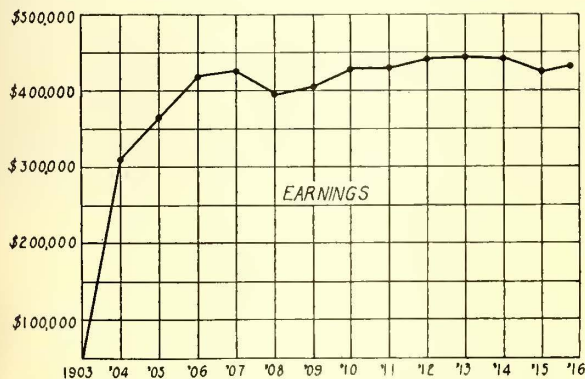
TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

INDIANAPOLIS, IND., Sept. 28, 1916.

To the Editors:

Referring to the recent article by F. W. Doolittle on the "Present and Future Development of Interurban Railways" in your issue of Sept. 2, I believe that one must not take too seriously his rather doleful analysis of "available" statistics. An attempt to read the horoscope of the interurban industry by means of the census reports, which do not comprehensively separate the urban and interurban lines without a first-hand knowledge of the systems themselves, is to do the lines a great injustice.

Any forecast for the average interurban necessarily depends upon the physical and income factors of the property. While the interurban is not subject to the same analysis as the steam road, it is primarily a railroad, and every effort of its management should be towards the intensified development of all the income factors to result in the maximum earning power of the property. This requires aggressive management, and if the road is not an economic blunder and has latent possibilities, its financial standing is assured. Otherwise, a reorganization has occasionally been found necessary to reduce the fixed charges so that its normal earnings



GRAPH SHOWING GROSS OF ONE INTERURBAN LINE

will easily take care of them. If the interurban cannot stand alone, it is certain to find its place as a unit in a larger utility company where the former errors of capitalization, engineering and operation can be corrected to the benefit of all concerned. The future of interurban lines was never brighter than at the present. The mistakes of interurban builders have been fewer in proportion than those of the steam roads.

Mr. Doolittle states: "Thirty years ago many of the shorter steam lines found themselves in the present situation of the electrical lines" *i.e.*, they were unable to get traffic agreements with the larger roads. The error of this analogy is appreciated from a knowledge of what was happening thirty years ago to the steam roads. In the period from 1892 to 1896, about 56,000 miles out of a total of 180,000 miles of main track passed into receivers' hands. This included among the "smaller" lines, the Southern Railway, the Wabash, the Erie, the Union Pacific, the Baltimore & Ohio, the Reading, the Aitchison, the Northern Pacific, etc. They had been loaded with debt. With generally unstable conditions in the banks and the loans exceeding deposits by 25 per

cent from 1890 to 1893, it would scarcely have been difficult for any intelligent observer to perceive that these roads could not escape a receivership.

Moreover, at Indianapolis, Columbia, Dayton and Louisville, interurban traffic agreements with the steam roads would now be useless without the expenditure of millions of dollars for freight terminals, yards, rebuilding lines, equipment. And would these expenditures be justified? There is considerable doubt.

The interurban lines out of Indianapolis were among the pioneer lines. The few mistakes these lines made in car design, overhead work, substation location, etc., have practically all been corrected. Any doubt as to the future will be quickly dispelled by going over the Chicago, Lake Shore & South Bend Traction Co., the Illinois Traction System, the Fort Dodge, Des Moines & Southern, or the Texas properties, which are among the newer lines. Still better, examine their financial statements.

The future of an interurban road is better understood if it is first considered from a financial standpoint. If one knows what is required as minimum earnings to protect the security holders, an examination of the earnings and a comparison of the earnings with those of other systems will better enable him to judge the possibilities of the road under discussion. For investment purposes, figures are reduced to earnings and costs per mile. Consider a theoretical case, as follows:

|                                                             |          |
|-------------------------------------------------------------|----------|
| The cost of an interurban per mile should be (minimum)..... | \$30,000 |
| Fixed charges at 5 per cent.....                            | 1,500    |
| The line should earn \$5,000 per mile a year.....           | \$5,000  |
| Operating expenses and taxes per mile at 60 per cent.....   | 3,000    |
| Balance.....                                                | \$2,000  |
| Less fixed charges per mile.....                            | 1,500    |
|                                                             | \$500    |
| Less sinking funds on bonds per mile.....                   | 250      |
| Surplus per mile.....                                       | \$250    |

Compare this with one of the oldest lines out of Indianapolis, built in 1904. Main line, 62.31 miles; branch, 23.76; total, 86.07 miles. Main terminal, Indianapolis; sub-terminal, Lafayette:

|                                                         |          |
|---------------------------------------------------------|----------|
| In a typical year the gross income per mile was.....    | \$4,700  |
| Operating expenses and taxes per mile (58 per cent).... | 2,770    |
| Balance.....                                            | \$1,930  |
| Fixed charges per mile.....                             | 1,430    |
|                                                         | \$500    |
| Dividends per mile.....                                 | 269      |
| Surplus per mile.....                                   | \$241    |
| Funded debt per mile (no sinking fund).....             | \$28,697 |
| Capital stock.....                                      | 5,228    |
| Total.....                                              | \$33,925 |

Would you state that this road is in a "doubtful condition"? The accompanying curve showing the gross earnings of this same line indicates how little the automobiles have affected the earnings. This line runs through the richest farming land in the State, and with the excellent roads it is surprising how little the earnings of this road have been reduced. Approximately 88 per cent of its earnings are derived from passenger traffic.

The statement by Mr. Doolittle "that the interurban is not a device for promoting the growth of communities." is erroneous and misleading. There are any number of towns near Indianapolis that have been wholly built up by the interurbans. Ben Davis, six miles west of Indianapolis, had 100 people in 1906. At the present time the population is nearly 1000. The inhabitants travel entirely on the interurban to Indianapolis. The Vandalia does not stop a train and has no station. The majority of residents are people who work in Indianapolis but prefer the advantages of living in the country. The merchants of Indianapolis, Fort Wayne, Lafay-

ette, Terre Haute and Richmond can testify in no uncertain terms as to the substantial and material effect of the interurbans upon the growth and prosperity of their community. The falling behind of Cincinnati in population compared to other cities of the same size has been ascribed directly to the lack of entrances and a proper interurban terminal for the various lines—a condition they are going to considerable expense to remedy. The movement of approximately 18,000 people a day in and out of Indianapolis, or the stoppage of this movement, as during the flood of 1913, would perhaps better illustrate the relation between the interurban and the communities they serve.

There are at present a number of interurban extensions and projects which only await the return of normal material prices and financial conditions to insure their completion.

The competition of automobile trucks with the traction freight service has not reached a serious phase. The dozen or so trucks operating out of Indianapolis in competition with our low freight rates generally go out of business after about twelve months of unprofitable operation.

A. J. BOARDMAN, Superintendent.

## More About the Building Association and the Loan Fund

EMPLOYEES' MUTUAL BENEFIT ASSOCIATION OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

MILWAUKEE, WIS., Sept. 30, 1916.

To the Editors:

In response to your suggestion that the readers of the *ELECTRIC RAILWAY JOURNAL* might be interested in learning more about the two funds which form a prominent feature of the welfare work of this company, and which were mentioned briefly in the abstract of my paper which you published in your issue for Sept. 9, 1916, I take pleasure in submitting the following:

Referring to page 443 of the issue mentioned, it will be noted that we have two entirely separate funds; namely, the fund of the Savings, Building & Loan Association, and the Loan Fund. These are quite distinct, the funds of the association being handled like those of any association of this type, while the Loan Fund is an entirely separate one furnished by the company.

The Savings, Building & Loan Association is a corporation organized under the laws of the State and subject to examination and regulation by the banking commissioners' office of the State. Any employee may purchase stock in the association and pay for it in installments of 50 cents per month per share. Another class of stock can be paid for at the rate of 75 cents per month per share, and there is still a third class which may be paid for at the rate of \$1 per month per share. The great majority of employees purchase the stock which is paid for at the rate of 50 cents per month per share. This stock matures in about eleven years. It will be seen that an employee taking \$1,000 worth of this stock will pay into the funds \$5 per month for a period of eleven years or a total of \$660. At the end of the eleven years, when his stock matures, he receives a check for the sum of \$1,000, the difference, \$340, being the interest which has accumulated on his savings. It will readily be seen that this makes saving very attractive to the average thrifty employee.

The Loan Fund was established nearly five years ago. As stated above, the funds are furnished entirely by the company and are intended to meet emergencies arising from sickness or death, or other trouble which may temporarily embarrass an employee. The amount that

may be loaned from the company fund is limited, of course, and application for a loan must be made through the superintendent under whom a man is directly employed. No interest charge is made but the employee is required to pay back into the fund a definite part of his loan per month.

This fund provides a remedy against unexpected financial emergencies which may confront a man and which might force him to seek relief at the hand of a loan shark.

BERT HALL, Welfare Secretary.

## Name for One-Man Car

CHARLOTTESVILLE & ALBEMARLE RAILWAY COMPANY

CHARLOTTESVILLE, VA., Sept. 26, 1916.

To the Editors:

I have noticed the discussion in your columns as to a suitable name for the one-man cars and suggest "Single Operated" as being the most appropriate.

We have recently placed the name of the operator in the front of the car, stating that "The operator of this



FRONT OF CAR IN CHARLOTTESVILLE

car is —," and we find this very satisfactory indeed. The accompanying illustration shows the front of one of our cars with this lettering. We have a small paddle with the operator's name on one side and that of his mate on the other. Then, when the second motorman boards the car he turns the paddle over and exposes his name. The paddle is suspended by two brass hooks.

JOHN L. LIVERS,

Vice-President and General Manager.

## Data for Determining Cause of Rail Corrugation

EMPLOYEES' MUTUAL BENEFIT ASSOCIATION OF THE DALLAS, TEX., Sept. 15, 1916.

To the Editors:

In a communication on page 407 of your issue for Feb. 26 I urged the compilation of a report blank covering, in the form of questions, all suspected causes of rail corrugation. Since writing this letter, I have been collecting opinions and facts from various sources on the subject, and as a result have prepared the accompanying list of questions, to which additions might well be made by others who have found other facts or theories with regard to rail corrugation which had not become known to the present writer. After this series has been made as nearly perfect as possible it could

be issued to advantage by the A. E. R. E. A. committee on corrugation in printed form to every street or interurban railway in the United States. When these are returned filled, the committee would have some definite basis on which to draw conclusions. The present method of discussing theories on this subject without complete data is simply a waste of time, as is the idea of taking the experience on corrugation of a few isolated properties, no matter how large those properties may be.

In this connection I might say that on a recent trip I visited a large number of members of the association, and in every case of street railway or interurban members I have found more or less trouble from rail corrugation. I have explained to each my idea in regard to this question list, and in every case the company has requested a copy of the questions inclosed, has promised to use them, and, where necessary, to add other questions which might cover any peculiar conditions on the track in question.

I see no other way of getting the necessary information on which to base positive data on this subject. Hitherto the method seems to have been for single individuals to form theories on this subject by pure mathematics, chemistry or mechanics, or else from their own isolated experience, and no such theory has been advanced by any one person which has not been immediately contradicted by another person either from theory or from isolated experience.

H. S. COOPER, Secretary.

#### "CORRUGATION DATA" SHEET

NOTE: Use separate sheet for each type, kind and weight of rail.

##### Rail

Dimensioned section of rail affected.  
Length of rail.  
Metallic constituency (analysis).

##### Sub-Base

Character, *i. e.*, concrete slab, concrete beam, stone, gravel, dirt?

##### Roadbed

"Ballasted" (under and between ties), stone, gravel, dirt.  
Depth of ballast under ties.  
"Rigid," depth of concrete under wooden tie, or, if steel tie is used, depth of concrete under rail.  
Does base of rail rest on the concrete for full length or only at ties?

##### Ties

Wood or steel. If former, give dimensions; if latter, give make and type.  
Spacing of ties (track center) on both tangent and curves.

##### Fastenings to Ties

If wood ties, kind of spike and number to tie. If metal ties, method and number of fastenings.  
If tie-rods are used, give spacing of same. If tie braces are used state whether every tie, alternate ties, etc.

##### Joints

Give make, type and number of bolts, rivets, etc., per joint.  
If welded joint, state method of welding.

##### Gage.

Give exact original gage of corrugated track.  
Give present gage of corrugated track.

##### Curves

Are all curves guarded? If *not*, give maximum radius of curve *not* guarded.  
Give gage of curves, both guarded and unguarded.  
Give elevation of curves according to radii—or otherwise.

##### Traffic

Is traffic one way or both on same track?  
If both, give proportion tons-per-wheel in each direction.

##### Cars

Maximum speed and average speed of cars over track affected.  
Single or double track. If both, give proportion of each.  
Wheelbase of single trucks. Truck wheelbase of double trucks.

##### Wheels

Diameter of driven wheels.  
Diameter of traveling or pony wheels.  
Cast iron or steel. If latter, give make and type.  
Give dimensioned section of tread and flange of all new wheels used on corrugated track.  
Give exact gage of new or repressed or reground wheels.

##### Braking

Hand, air or magnetic? Are coasting recorders or watt-meters used?

#### Paving

Give *kind* and *condition* of paving between and outside of rails.

#### General Questions

Do you grease or oil any curves, all curves, or only those that are guarded or of a certain minimum radius?

What lubricant do you use on curves and how do you apply it?

NOTE: In answering the following "comparative" questions please bear in mind that the comparison is desired only as between similar rail, sub-base and roadbed.

Have you noticed any difference in corrugation between curves that were lubricated or not lubricated? Which were less corrugated?

Have you noticed any difference in corrugation on the tangent rail running out of the curves lubricated and not lubricated?

Have you occasion for frequent or copious use of sand on the whole or portions of the corrugated track?

Have you noticed any difference in corrugation where sand is not used and where it is used?

Are any portions of your tracks regularly artificially watered?

Have you noticed any difference in corrugation between the portions artificially watered and those subject only to rainfall?

Have you any street intersections in paved streets where unpaved streets come in and where dirt is brought in from these streets onto your track?

Have you noticed any difference as to corrugation at such points as compared to intersections of paved streets?

Is the corrugation worse on tangent or on curved track?

Is the corrugation worse on the inside or outside rail of guarded curves? What is the situation with respect to unguarded curves?

Is the corrugation worse on rail where cars are operated entirely in one direction?

Is the corrugation worse on levels or grades, and, if cars are operated only in one direction, is it worse on ascending or descending grades?

#### Some Leading Questions

Taking into consideration the conditions contained in above questions, the portion of your rail that is worst corrugated is operated under which of these conditions? Answer this by writing the numbers preceding the questions giving the conditions.

Have you any theory, based on your experience or full knowledge of all track and traffic conditions in one or more localities, as to the actual cause, or causes, of rail corrugation?

Have you any practical suggestion as to its elimination, diminution or prevention?

NOTE: As the above requested theory and suggestion are desired from actual practical experience and knowledge, it is necessary that the questions preceding the last three be answered.

## The Car-Development Issue

UNIVERSITY OF ILLINOIS

URBANA, ILL., Oct. 4, 1916.

To the Editors:

Allow me to congratulate you on the Convention Issue of the JOURNAL for Sept. 30, 1916, which has recently been received. Although I have not had time to go through the various articles in detail, it appears to be a masterpiece on the subject of cars and car equipment.

The subject is timely, coming as it does when economies must be introduced wherever possible. I am convinced that car design warrants more study, not perhaps from the builder's standpoint, but from that of the user. Being treated from this side, the entire issue is valuable to the operating company and to the student of electric railway problems.

I am especially glad that you are trying to explode the "local conditions fallacy." The more one travels in different communities, the more evident does it become that the problem of rapid transit is one common to all, and that the solution may be a general one regardless of locality. The resulting changes to meet local conditions have been in most cases trifling in their general effect, while they invariably increase the cost of equipment to what might well be termed a prohibitive figure.

Ten years ago one might have pointed to a number of types of cars that could be well called "standard." Now there is no uniformity in type, even for the same service in the same city. May it not well be that we are passing through a transition period in the design of equipment, and that in a few more years a set of new and improved standard types will be evolved from the present chaotic conditions?

A. M. BUCK,

Assistant Professor of Electric Railway Engineering.

# Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

D. C. Regenerative Locomotive on Canadian Railway—Measuring Reciprocating Engine Steam Flow—Sleet Cutter for Over-running Third Rail—New Shockless Railroad Crossing—Reverse Phase Relay of New Design—Operating Features of Condenser Arrester

## The Steam Flow Meter Applied to Reciprocating Steam Engines

BY VICTOR B. PHILLIPS

Engineering Assistant, Cleveland (Ohio) Railway

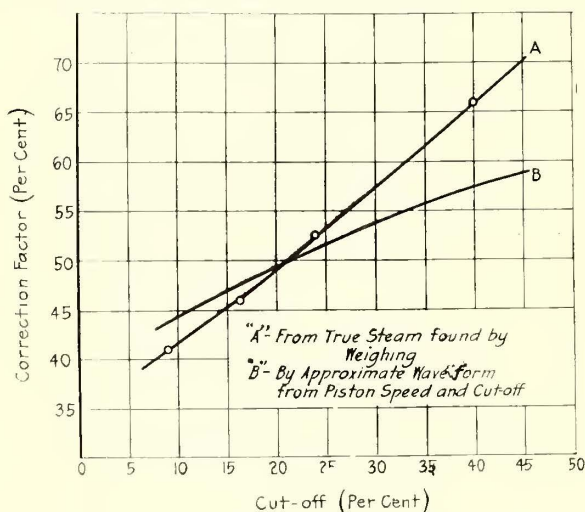
It is frequently necessary to measure with some accuracy the steam consumption of a reciprocating engine. In plants of any size the maintenance of the pistons and cylinders, in order to hold down the loss from leakage steam, is a large item of expense. A check on this loss is important. Except where surface condensers are used, there has been no direct way of measuring the engine steam consumption, other than the use of some factor applied to the indicated steam. Because of the wide variation of leakage steam, the indicator card is practically of no value in this connection. The writer recently had occasion to measure the steam consumption

ceived as a regularly intermittent wave flow. An analogy would be the wave of an oscillatory electric current where the instantaneous value of current corresponds to the rate of flow of steam. Furthermore, a steam flow meter measuring this pulsating flow may be likened to an ammeter for measuring oscillatory or alternating current. In electrical power measurements we are interested primarily in the effective value of an alternating current—in other words, the square root of the average of the squared instantaneous current values and an a.c. ammeter is made to read in terms of effective amperes. In order to accomplish this the needle of an a.c. ammeter is damped so as to stand steady at a point corresponding to the average of the deflections for the instantaneous current values. Suppose now, that the mercury columns of a steam flow meter be so damped as to prevent their oscillation with intermittent flow. The result is an instrument closely analogous to the a.c. ammeter, and it is evident that a meter so damped will show a deflection corresponding to the average of the squares of the instantaneous velocities and that the scale will show a value corresponding to the square root of this deflection. In the case of steady flow for which the meter is originally calibrated, this square root of the average square is the same as the average of the instantaneous values; just as in direct current we make no distinction between average and effective current because they are the same.

On the other hand, in alternating current whatever the wave form, effective current is always larger than average current and the ratio of these two values depends entirely upon the wave form. The case is similar for steam flow, and we may conclude that whatever the form of the pulsation wave existing in the steam header the reading of the meter from the steady flow scale will be larger than the average velocity. As it is the average velocity in which we are interested and not the "effective" velocity, the meter reading will always be too high, and the ratio that it bears to the proper value will depend entirely upon the wave form of the intermittent flow. If it were possible to determine the nature and form of the pulsation wave existing in the steam header, we could readily arrive at the correction factor to be applied to the meter reading. However, the complexity of the wave form and the difficulties incident to such a determination preclude the possibility of all but empirical constants. The writer did try to approximate the wave form from the instantaneous piston speeds, for various cut-offs, but the constants determined from these approximated wave forms varied considerably from the actual constants. The results are shown graphically and indicate some relation between theoretical and actual values but insufficient correspondence to be of practical value.\* The results are of value, however, in that they show some correspondence to theory—even the crude theory represented by the curve.

In any event, we may conclude that the general

\*The actual constants referred to here were determined by reading the meter and simultaneously weighing the condensate, using a surface condenser.



CURVES SHOWING RELATION OF STEAM FLOW METER CORRECTION FACTOR TO POINT OF CUT-OFF

of some large reciprocating engines, and to this end investigated the subject in its various phases, including the use of the steam flow meter.

At first thought the use of the steam flow meter for this purpose seems quite impracticable. The meters generally used are designed for steady, uniform flow only. Of these the pitot tube type of meter is the most common. Now the steam headers leading to large engines invariably vibrate in spite of the most rigid fastenings and we have therefore some idea of the extremely turbulent and violent conditions of flow, which exist in these headers. Obviously then, these conditions preclude all possibility of analysis, and whatever constants are involved must be empirical. The pitot tube, perhaps more than any other means of measuring fluid flow, requires proper conditions. Therefore its use in connection with pulsating flow must at best be lacking in close accuracy, while the use of empirical constants may be had only under the strictest adherence to the limiting conditions of these constants.

The steam flow in an engine header may be con-



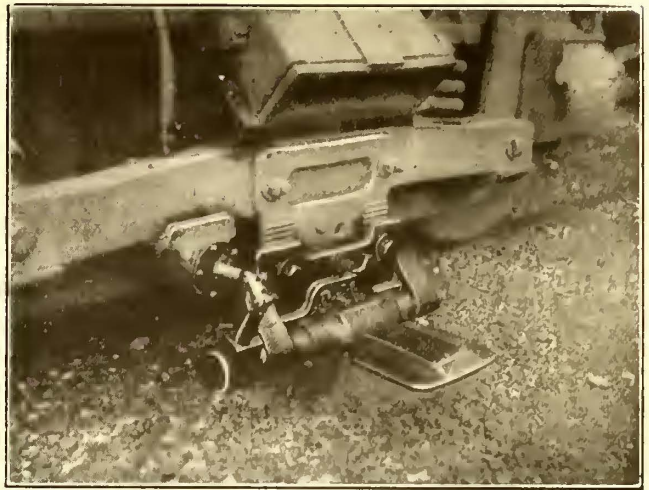
theory outlined above is entirely valid and that the use of empirical constants, having due regard for the type of engine and piping arrangement, is practical. Data obtained by the writer, although necessarily limited, verify this conclusion.

The first step in applying the steam flow meter to pulsating flow is the effective damping out of all pulsating motion in the mercury columns of the meter. This may be accomplished by simply introducing into the columns orifices of sufficient restriction. In the present instance short lengths of glass capillary tubing were fitted into place by bushings of rubber tubing. The result was, in this case, the total elimination of all movement of the columns due to the intermittency of flow; but at the same time an instantaneous response to the smallest changes of load upon the engine. The principle of this method of damping is, of course, readily understood and needs no further treatment. It is certainly very simple and entirely effective. Perhaps for some types of fluid flow meters this device may be impracticable; but in any event its equivalent should be readily devised.

As already indicated the correction constants to be applied to the meter readings on intermittent flow depend upon wave form and therefore upon cut-off and load. The values of these constants or correction factors must be determined empirically. They must, moreover, be limited in their application to a close adherence to the conditions under which they are formulated. However, it should be pointed out that in the case of large engines especially, the number of distinctly different types of engines and of different pipe sizes and relations is exceedingly limited. It is only in application to large units that any system of measuring steam consumption is justifiable. Hence, a comparatively small amount of empirical data should make feasible the direct measurement of steam delivered to any kind of steam engine—certainly a measurement eminently worth while.

Before concluding, the procedure followed by the writer in determining the necessary correction factors for the particular case in hand will be outlined. The meter was connected into the high-pressure pipe leading to a 1200-kw. Robert Wetherill engine, operating on a surface condenser. The engine was then held at a number of different loads and the condensate weighed for definite periods of time. At the same time the steam flow meter was read and the cut-off determined by indicator cards. In this way the relation between correction factor and cut-off was established. The meter was then applied to a 1600-kw. C. G. Cooper engine operating non-condensing. The relation between load and cut-off was determined for this engine. It was then assumed that for the same percentages of cut-off the correction factor was the same for both engines, and in this way the factor for each load was readily available. Later, the steam consumption of an entire non-condensing plant determined in general, by this method, was closely checked by exceedingly exhaustive and careful heat balances in which the prime-mover consumption was found by the method of difference. The discrepancies were less than 2 per cent, thus affording a close check upon the method of direct measurement by meter.

In conclusion, the writer wishes not to propose unreservedly the application of the steam flow meter to pulsating flow, but rather merely to suggest this way of measuring engine steam consumption to the end of further discussion and investigation. The desirability of such a measurement in many cases is evident, and the results here presented, though exceedingly limited, do perhaps merit further consideration.



SLEET-CUTTING SHOE IN POSITION, SHOWING LOCKING PIN, AIR HOSE AND CYLINDER

## Combination Sleet Cutter and Current Collector

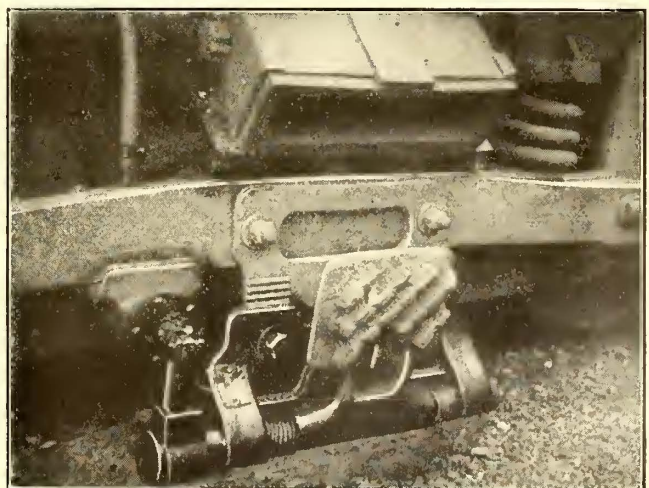
A Home-Made Pneumatic Device for Cutting Sleet on Covered Over-running Third-Rail

BY J. B. BLAIKLOCK

Master Mechanic Atlantic City & Shore Railroad

The accompanying description and photographs are of a pneumatic sleet cutter designed by the writer for cutting sleet on a covered over-running third-rail system.

On account of the small clearance between the third-rail and cover it was necessary to design a cutting shoe which could be left down. The pressure is applied from the motorman's cab without disturbing the shoe, which had also to be used as a current collector. The ordinary slipper type shoe similar to that used by the Atlantic City & Shore Railroad on its Ocean City division, is hinged on a 1-in. spindle which is rigidly held in the shoe bracket by cotter pins. This is changed in the sleet cutting shoe, and the bracket holes are bushed with brass and the spindle lengthened out to take the crank, which is operated by the air cylinder. The spindle is made to work easily in the brass bushings and is held in position by steel collars bolted to it. The end of the spindle is keyed for a  $\frac{3}{8}$ -in. key and a 2-in. steel drum is fastened to it. The crank works on this drum and



SLEET-CUTTING SHOE IN A RAISED POSITION, SHOWING TOOTHED STEEL BLADES WELDED ONTO THE SHOE

is thrown in and out of gear by a small steel pin, fitted with a tee handle. The ordinary shoe springs are left on and when the sleet cutting device is not needed the small pin is lifted up and the shoe is then free to work in the usual way.

The hole in the drum in which the pin engages is bored out, which allows the shoe about  $1\frac{1}{2}$ -in. lift when the air is not on and the mechanism is in mesh. The cylinder is made from a gray iron casting, bored out to 2 in. in diameter, and is bolted to the underside of the third-rail beam. There is a  $\frac{5}{8}$ -in. flange left on the top of the cylinder which fits up snug to the beam and takes the thrust off of the holding bolts.

The piston is made of steel and is fitted with a 2-in. cup leather. The piston rod is attached to the crank by a small steel link, which makes a flexible connection and also allows a slight adjustment of the shoe.

The cutting shoe is of the ordinary type with hard steel blades electrically welded to the underside. These blades are ground with toothed edges to help the breaking up of the sleet.

The car is fitted with two steel cutters, one on either side, and the air is supplied through  $2\frac{3}{8}$ -in. pipes, which are bolted to the truck. These pipes are connected to the pipes on the underside of the car with rubber hose which allow for the free movement of the truck. A piece of rubber hose connects the end of the pipe on the truck with the air cylinder and insulates it from the ground. The valves in this piping system are located in the cab. There is a one-way and a two-way valve, which allows either shoe to be operated.

With a tank pressure of 100 lb. per square inch, we get approximately 600 lb. per square inch on the shoe, which is sufficient for ordinary sleet storms. The weight of the extra mechanism on each shoe is 24 lb. and the total weight, including pipes, etc., is approximately 55 lb. The whole apparatus, except the air piping on the car body, is removed after the winter season.

## D.C. Regenerative Locomotive on the Lake Erie & Northern\*

By Separately Exciting Fields of Motors Power Is Returned to Line on Descending Grades at Speeds Above 7 M.P.H.

BY C. C. WHITTAKER

After extensive tests there was placed in service on the Lake Erie & Northern Railway in April of this year a 1500-volt, direct-current regenerative locomotive. This locomotive is of the standard Baldwin-Westinghouse swivel-truck type, weighing 60 tons, having 36-in. wheels and equipped with four standard, 125-hp. field-control motors, geared 24:53. It is designed for passenger or fast freight service and is capable of exerting a continuous tractive effort of 6520 lb. at 26.5 m.p.h., and 8520 lb. at 22 m.p.h.

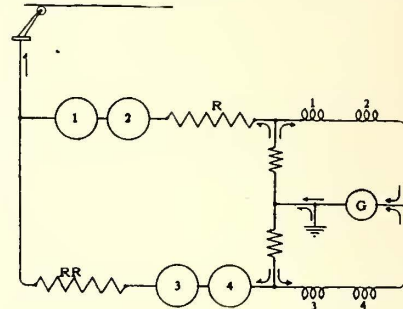
The control for acceleration consists of the usual bridging control, except that the motors are bridged both in going from series to parallel, and from parallel to series when shutting off. Beside being necessary to the regenerative control, this feature is advantageous for acceleration alone, as much of the burning on the transition switches is eliminated.

Both acceleration and regeneration are controlled by a single master controller. This is provided with the usual mechanical interlocks between the main and reverser levers and with other special mechanical interlocks which render false manipulation by the operator

\*For an article describing the general features of the 1500-volt electrification between Galt and Brantford, Ont., see *ELECTRIC RAILWAY JOURNAL*, issue of May 27, 1916, page 986.

impossible. There are sixteen notches for acceleration and eleven for regeneration. The operation of the control during acceleration is entirely manual, while during regeneration it is either manual or automatic, as desired.

Regeneration is accomplished by using the main motors as generators connected in series-parallel at the higher speeds, and all in series on the lower speeds. The fields are separately excited during regeneration by

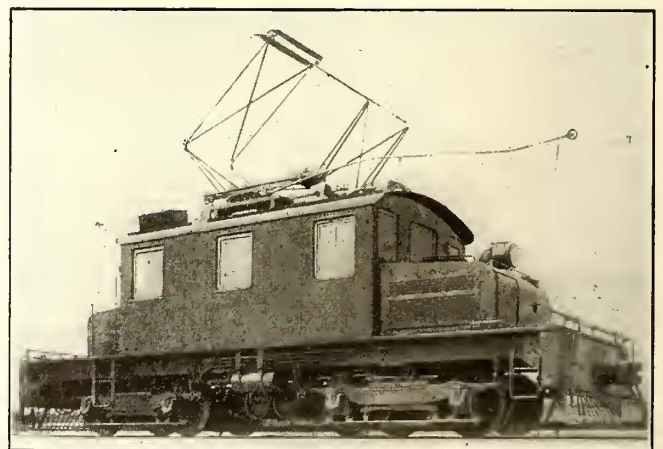


SIMPLIFIED DIAGRAM OF CONNECTIONS OF REGENERATIVE LOCOMOTIVE WITH CONTROLLER ON FIRST NOTCH FOR REGENERATION

current from a motor-driven series generator, whose voltage ranges from 70 to 85.

The field control feature is used only on acceleration, all regenerative running being done with the full field connection in order to decrease the current required for excitation. A simplified diagram of the connections obtained on the first notch when regenerating is shown herewith. From the location of the ground connection it will be seen that the regenerated current flowing from the substation through the ground connection passes through the same resistor as the exciting current from the generator, and in the same direction. The effect of this condition is to weaken the main motor fields automatically whenever the regenerated current increases. This means of securing motor stability has proved exceptionally effective, the motors never having flashed over either while on test or since installation.

On account of this inherent stability during regenera-



1500-VOLT, D. C. REGENERATIVE LOCOMOTIVE ON LAKE ERIE & NORTHERN RAILWAY

tion, it is not essential that the line voltage be the same as the regenerated voltage when the locomotive motors are first connected to the line. Tests show that motors may be connected to the line without injury when regenerating at double line voltage. A selective relay is arranged to control the line switch connecting the motors to the line and is adjusted to cause this line switch to close whenever the controller is in a regenerative

position and when the voltage generated by the motors is approximately 1500. If the speed of the locomotive is sufficiently high when the controller is turned to the braking position, the selective relay will act on the first notch; if not, the field drum will automatically rotate notch by notch, short-circuiting the resistance in series with the motor fields, thereby strengthening them until the voltage generated is sufficient to cause the selective relay to act. This will bring in the line switch and complete the main circuit to the line. The resistances, *R* and *RR* in the diagram, are in series with the motors when the first switch closes, and the rotation of the field drum is stopped from the time the line switch closes until this series resistance has been cut out.

The field drum and change-over switch are mounted in the cab. The main drum is rotated by means of a standard *PK* operating head. The upper part of the main drum is provided with interlock fingers so connected that it is possible to move the drum from the master controller, notch by notch, in either direction. A second drum manipulates the main and control change-over connections, and is operated by the usual reversing mechanism of the *PK* head. It also is controlled from the master controller.

Connected in series with the main motor armatures is a low-current relay, the function of which is to disconnect the motors from the line when regenerating with the motor fields at maximum excitation as soon as the regenerated current has fallen to approximately 30 amp. per motor. This feature prevents needless overheating of the main fields while the regenerated current is inappreciable.

A fan, supplying air to the main motors and serving as a load to keep down the speed of the motor-generator set when there is no load on the generator, is mounted on an extension of the shaft at the generator end. The motor-generator set weighs 1500 lb., or 50 per cent more than the blower motor which would be required if this set were not used. The motor is provided with a series field connected in series with the field of the generator.

This locomotive is not designed to regenerate at speeds below 7 m.p.h., since to do this would require too much current through the main fields. Moreover, in reducing the speed to 7 m.p.h., approximately 93 per cent of the kinetic energy which was stored in the train when running at 26.5 m.p.h. has been utilized.

The smoothest stop is made when the controller lever is turned to the last notch, resulting in automatic regeneration. Then, as the ammeter indicates that the regenerated current is falling off after the last notch on the field drum has been reached, an air-brake application should be made which will begin to retard the train just before the retardation from the regenerative brake ceases. When the regenerated current drops to 30 amp., the low-current relay will operate, disconnecting the motors from the line, and the remainder of the stop is made by the air brakes.

Among the principal advantages which regenerative control in general offers are:

1. Decrease in net power consumption.
2. Decrease in wear on brakeshoes, wheels and brake rigging.
3. Decrease in brakeshoe dust nuisance with reference to subways.
4. Decrease in heat liberated from brakeshoes with reference to subways.
5. Additional means of braking, thereby affording greater safety.

From the results thus far obtained, when applied where conditions warrant, this system of regenerative braking promises to yield very satisfactory results.

## The Condenser Lightning Arrester for Electric Railway Protection

BY Q. A. BRACKETT

Previous to the development of adequate lightning arresters it was not an unusual procedure for a conductor to protect his car from lightning during a storm by stopping the car and pulling down the trolley. Nowadays such an interruption to service would never be tolerated, and at night passengers would never be willing to be left in darkness unnecessarily. It was but natural therefore that other and better methods of protection should be developed as the need grew with the progress of the industry.

Next to disconnecting the apparatus from the line, the most effective protection from incoming lightning surges would be to dead ground the line directly ahead of the apparatus. In the past it has not been considered possible to make use of this method of protection while there was power on the line, as the short-circuit for the lightning was also a short-circuit for the dynamic current.

The development of the condenser arrester, however, has made it possible now to use this very effective method of protection without any of its former disadvantages. This is due to the fact that the lightning current is of very high frequency while the power current is direct. It is only necessary, therefore, to ground the line through some device which will let high frequency current pass freely, yet will oppose the flow of direct current. The condenser possesses these characteristics; to direct current it is an insulator, while to current of lightning frequencies it is an almost perfect conductor.

If, then, a condenser of adequate dielectric strength and capacity is connected directly between line and ground ahead of the apparatus to be protected, it will provide a short circuit for incoming lightning, but will not allow the escape of any power current whatever. Unlike other arresters, it needs no series spark gap to protect it from leakage of power current and subsequent overheating. Likewise, it has no power current to break following lightning discharge and, therefore, needs no series resistance to assist it at the expense of reducing its freedom of discharge. This also means less burning and wear and tear on the arrester, fewer surges on the line, and eliminates all need for current interrupting devices such as circuit breakers, magnetic blowouts, etc. Maintenance expense is reduced practically to zero, since the arrester is not affected by heat or cold and has no parts that deteriorate or need re-adjustment. This low maintenance expense is especially important in the case of railway arresters either for car or line protection on account of the large number of units involved.

The condenser itself is impregnated with a special wax of much higher dielectric strength and melting point than the paraffine hitherto commonly used in the manufacture of condensers. This condenser, properly insulated, is inclosed in a weatherproof iron box. Between the condenser and the line lead an adjustable series spark gap is provided, while the condenser itself is shunted by a high resistance. When the spark gap is used the resistance serves to keep the condenser discharged down to zero voltage, so that it can provide somewhat greater protection than it could if always charged to line voltage, as would be the case if the spark gap was not used. The latter can be set extremely close to the line voltage since there is no power current to interrupt.

Where the apparatus to be protected is old or known to have weak insulation, so that it could not stand the

voltage rise necessary to break down even a short series spark gap, the gap should be closed entirely. This will do no harm whatever to the arrester and will enable it to protect weak insulation more readily. This in various cases has made possible the regular operation of cars whose motors without this type of protection would have had to be rewound on account of weakened insulation.

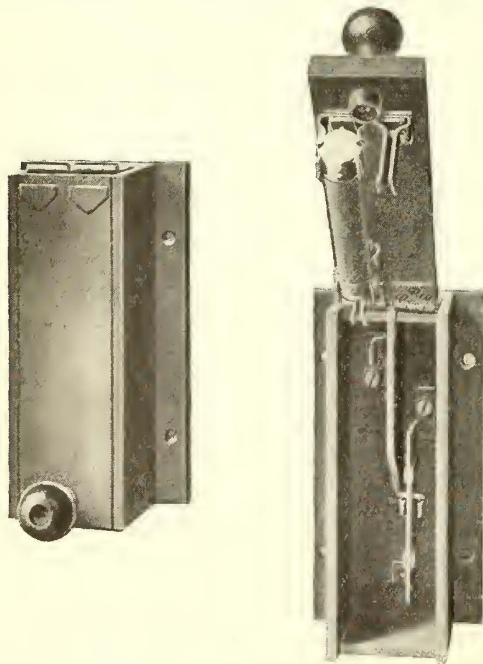
While the condenser arrester is comparatively a newcomer in the electric railway field it is by no means an untried experiment. The first 1500-volt direct-current line in this country was equipped with condenser arresters on all its rolling stock as early as 1911, and the results have been so satisfactory that most of the line is now protected by condensers as well. Many other installations have since been made throughout the country. The present season, however, has brought marked improvements in condenser design that have resulted in both better condensers and smaller sized complete arresters.

Arresters of the present design will pass 500 amp. without allowing the voltage to rise above 800 volts, or 1000 amp. with a voltage not over 1600 at a frequency of 10,000 cycles per second. Almost all lightning surges are of still higher frequencies. At 1,000,000 cycles the above current values would become 5000 and 10,000 amp. respectively. No other form of arrester, with the possible exception of the electrolytic type, comes anywhere near providing such freedom of discharge, and the electrolytic type has a maintenance expense many times greater, which makes it less suitable for car and line protection where many units are involved.

### An Inclosed-Fused Switch

The Anderson-Ellcon inclosed-fused switch, shown herewith, has just been placed on the market by the Ellcon Company, New York.

This switch consists of a fuse, clips and a knife blade installed in an insulated box, which is made of a com-



QUICK-BREAK FUSED SWITCH, SHOWING DETAILS OF CONSTRUCTION

ination of impregnated asbestos lumber, fiber and alberene stone. It is so constructed that when opened the fuse terminals are disconnected from the live metal parts and are exposed in such a way as to render them

most accessible for the examination or replacement of fuses.

These switches are designed for high voltage direct-current circuits and are made in both single and double-pole units, the single pole being used principally on grounded circuits.

### Automatic Tap-Changers for Voltage Regulation

For the purpose of insuring good voltage regulation for the Philadelphia-Paoli electrification of the Pennsylvania Railroad, pending the completion of the Chestnut Hill electrification which will help to balance the load on the three-phase generators, an automatic trans-

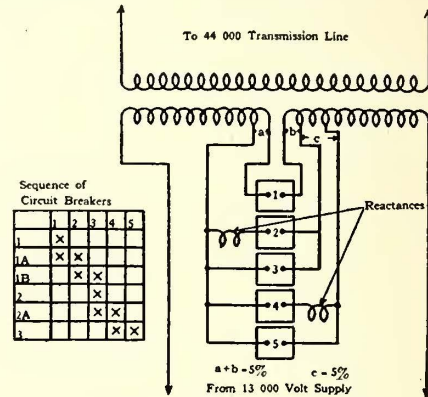


DIAGRAM OF "TAP-CHANGER" APPLIED TO A STEP-UP TRANSFORMER

Steps 1, 2 and 3 are operating positions; other steps are transition positions.

former tap changing device is in use. The principle is shown in the accompanying diagram.

The ratio of transformation and, therefore, the secondary voltage are changed by varying the relative numbers of transformer turns, electro-pneumatically operated oil switches being used for this purpose. The control is automatic, being operated by a compensator, and interlocks are provided to prevent improper operation of the switches.

### A Recent Projector

Since its recent purchase of the headlight, searchlight and lamp business from the Esterline Company, Indianapolis, Ind., the Electric Service Supplies Company has perfected a golden glow projector, which has all the inherent qualities of the golden glow headlight.

It is molded from a greenish-yellow glass, ground to a true parabola by special machinery and polished and silvered as would be the finest French plate glass mirrors. The violet, ultra-violet and other high frequency rays are absorbed by the glass reflector thus projecting a powerful beam of golden-yellow light. These projectors have already been found particularly well adapted to flood-lighting sections of track on electric and steam roads where construction work is carried on at night.

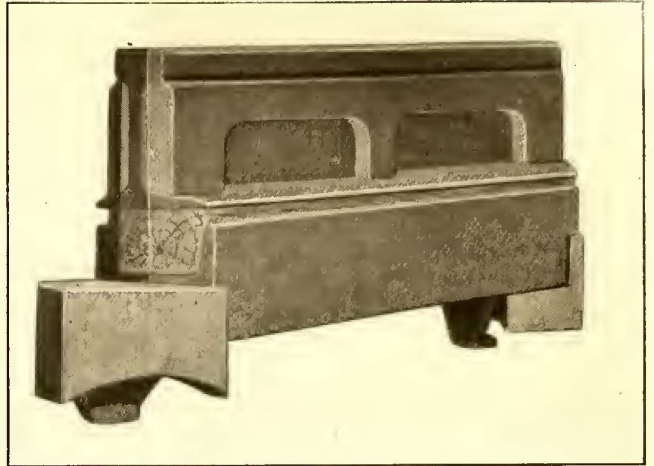
They are manufactured in two sizes, the smaller size being equipped with a 9-in. diameter reflector while the larger size employs a 12-in. reflector. Concentrated filament lamps of any wattage up to 150 in G-25 bulbs having a light center distance of 2 1/4 in. may be used with the 9-in. reflector, while the 12-in. reflector takes concentrated filament lamps up to 250 watts in G-30 bulbs, having a light center distance of 2 3/4 in. They are equipped with a focusing device accessible from the outside of the shell so that the beam of light, by a simple adjustment of the focal center, may be concentrated in a straight beam or dispersed to cover a large area.

## Shockless Crossing Now Equipped for Automatic Operation

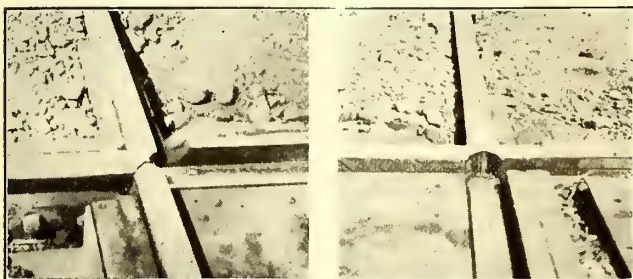
Control Circuits Are Similar to Those of an Automatic Block Signal System

About two years ago at Slauson Junction, Los Angeles, Cal., a Cobb shockless crossing was installed at the intersection of the tracks of the Pacific Electric and the Santa Fé Railway. This installation was reported in the *ELECTRIC RAILWAY JOURNAL* for May 22, 1915, page 994, after it had been in successful operation for about six months. One of the accompanying illustrations shows the present appearance of this crossing after having withstood the severe traffic to which it has been subjected for about two years.

The daily electric traffic at this point consists of 360 high-speed electric cars made up into 240 trains, aggregating 15,000 tons, while the steam traffic of about 5000



THE MOVABLE ELEMENT OF THE SHOCKLESS CROSSING, SHOWING THE MOUNTING OF THE RAIL



TWO VIEWS OF THE SHOCKLESS CROSSING AT SLAUSON JUNCTION, LOS ANGELES, CAL., AFTER BEING IN OPERATION FOR TWO YEARS

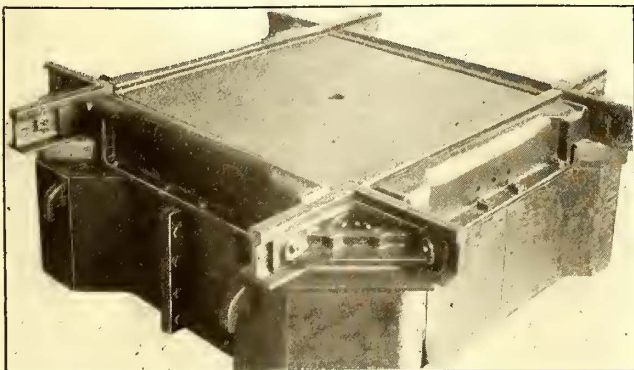
tons daily comprises heavily-loaded freight cars and a few passenger trains. There have been no accidents or delays at the intersection, the rails have not required replacement, and they show less wear than that on a manganese crossing installed on a near-by branch line where the traffic is only one-quarter as great. It is said that the trains pass over the shockless crossing with no more noise or jar than is experienced on continuous rails.

In this crossing the necessity for jump gaps is eliminated by depressing, by a suitable mechanism, the rails which are not in use. The through rails remain at grade, and are so abutted that a continuous bearing surface is presented to the car wheels. The raising and lowering of the rails at the crossing at Slauson Junction is controlled from an interlocking tower, which also controls the switches, signals and derailleurs at this point.

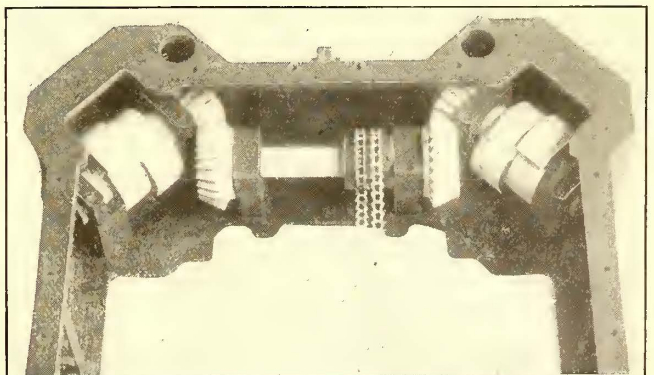
The excellent results obtained by this crossing led to the installation of a shockless crossing at the intersection of Fourth and Main Streets, Los Angeles. At this location, where the shockless crossing has been installed about six months, several special problems had to be solved. Both the Pacific Electric and the Los Angeles Railway operate cars on Main Street, and as the Los Angeles Railway is a narrow-gage line there are six rails on this street instead of four. The crossing is electrically operated and electrically and automatically controlled, the control circuits being similar to those of an automatic block signal system except that they operate the crossing rails instead of signals.

As the traffic on Main Street is much greater than that on Fourth Street, the control is so arranged that the crossing rails are normally set for the Main Street traffic to pass. The Main Street cars, however, have no control over the action of the crossings, the control of which lies entirely with the Fourth Street cars, which on approaching the crossing cause it to be automatically set so that they can pass. As soon as the Fourth Street car has passed out of the block, the mechanism automatically goes back, so that it is set for the Main Street traffic.

Since the crossing at Main and Fourth Streets was installed further developments have been made which include an improved method for moving the rails. The accompanying illustrations show the latest type of crossing in which the rails are raised and lowered by cams, and the diagram shows how two solenoids are used to accomplish the necessary movement of the camshafts.



THE EXTERNAL APPEARANCE OF THE SHOCKLESS CROSSING, SHOWING THE FOUR FIXED RAIL CORNERS RIGIDLY BRACED BY THE CONNECTING STRUTS



HALF OF THE INSIDE OF THE SHOCKLESS CROSSING, SHOWING THE CENTER DRIVING SHAFT AND THE CAMS WHICH RAISE AND LOWER THE RAILS

A heavy cast-iron box made of four sections bolted together forms the foundation of the whole construction. The fixed rail corners rest upon wooden blocks inclosed in 12-in. iron channels, which in turn rest across the corners of the box foundation. Tightly fitted between the fixed rail corners are cast-iron struts, which are securely bolted to the foundation, and inside these struts are the movable rails. One of these rails is shown in an accompanying illustration. The rail itself rests on a hardwood block which is inclosed between the web and two flanges of a steel I-beam.

Fastened to each end of the I-beam is a cast-steel shoe, the lower surface of which bears upon the cam. The upper surface of this shoe extends a few inches beyond the end of the I-beam, and when the rail is in the upper position this surface comes in contact with the lower surface of the channel iron which supports the fixed rail corner, the movable rail being thus locked between the cam and the fixed rail corner. This also provides additional support for the fixed rail corner and prevents any jamming or rattling. A cast-steel hook is bolted to the side of each shoe. These hooks fit in grooves in the sides of the cams and serve to pull the rail downward should there be any tendency for it to stick due to the accumulation of dirt or grit. On the sides of the rail are cast-iron filler pieces, the object of which is to prevent stones and foreign material from working into the crossing.

The rails move up and down through channels with just sufficient play to allow them to move freely, and with enough force to crush any small stones or ice that may get in between the rails and the adjoining iron work. There is no possibility of individuals or vehicles becoming caught in any of the moving parts, because there is no lateral motion nor is there any projecting moving part above the cover.

Half of the internal mechanism of the crossing is shown herewith. The camshafts are supported on journal boxes, which rest on short columns cast integral with the cast iron box foundation. These shafts are geared to the center shaft, which is supported by heavy pedestal bearings bolted to the foundation. The center shaft is driven by heavy

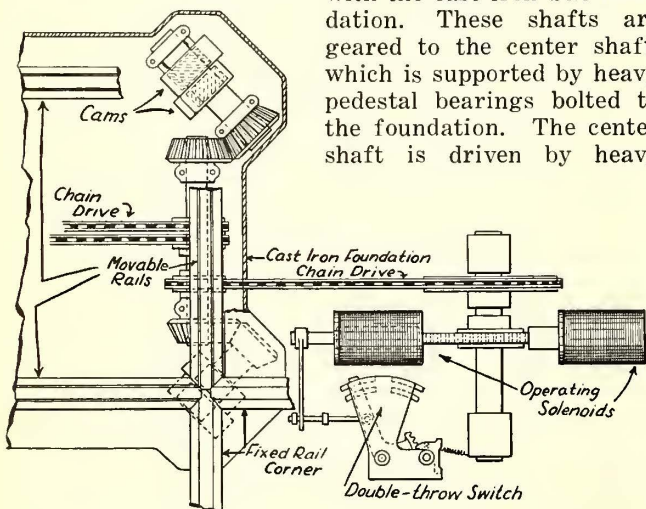


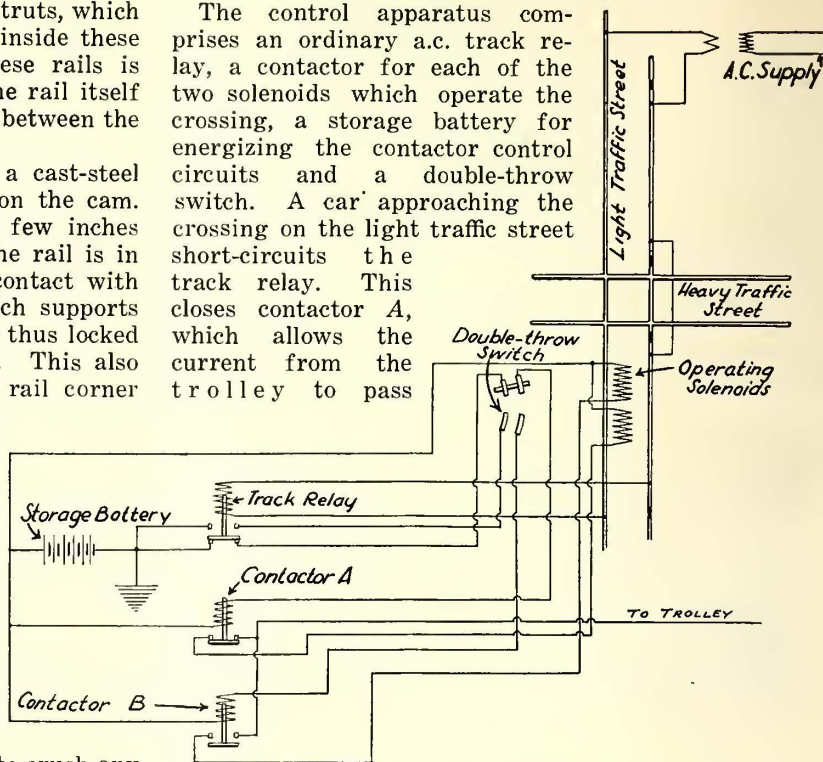
DIAGRAM OF THE OPERATING MECHANISM OF THE SHOCKLESS CROSSING

chains connected to the solenoids, as shown in the diagram. Cast-steel gears are used, and there is no complicated machine work in the whole construction.

The accompanying diagram shows the control circuits, by means of which the automatic operation of the crossing is carried out. On the diagram the street having the greater traffic is indicated as the heavy

traffic street, while the intersecting street is called the light traffic street. The crossing is normally set for cars running on the heavy traffic street, and the cars approaching the crossing on the light traffic street cause it to be set automatically so that they can pass.

The control apparatus comprises an ordinary a.c. track relay, a contactor for each of the two solenoids which operate the crossing, a storage battery for energizing the contactor control circuits and a double-throw switch. A car approaching the crossing on the light traffic street short-circuits the track relay. This closes contactor A, which allows the current from the trolley to pass



WIRING DIAGRAM OF THE CONTROL CIRCUITS FOR THE AUTOMATIC OPERATION OF THE SHOCKLESS CROSSING

through the solenoid and operate the crossing, setting the rails so that the approaching car can pass. The movement of this solenoid also shifts the double-throw switch so that when the car leaves the block the track relay closes contactor B, allowing the current from the trolley to pass through the other solenoid, which resets the rails for the cars on the heavy traffic street. This completes the cycle.

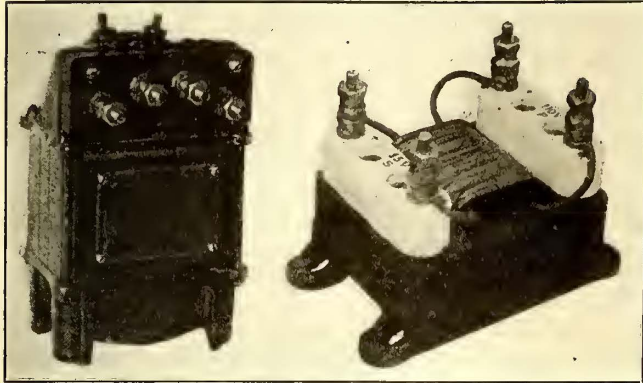
In the crossings that have been installed the operation requires from three seconds to four seconds. The power required to raise and lower the rails under normal operation, of course, is small, but to take care of any emergencies such as the front wheels of a car coming on the crossing before the rails have been completely raised, the operating mechanism is made strong and powerful enough to raise the rails when a car is on them.

While the crossing just described is operated by solenoids it is obvious that an electric motor, a compressed air mechanism or any other mechanical device can be substituted for the solenoids, the only requirement being that the main driving shaft shall make three-quarters of a revolution in one direction to bring one pair of rails into the grade position, and then a three-quarters revolution in the opposite direction to reverse the operation.

The driving apparatus is preferably placed in a compartment outside the box containing the crossing mechanism, so that it can be more readily inspected, and so that traffic on only one track will be blocked if repairs have to be made. Provision is made for operating the crossing by hand in cases of emergency. Thus far, only crossings in which the tracks intersect at right angles have been equipped, but preliminary designs have been made, to adapt the shockless crossing to tracks intersecting at different angles and on curves.

### Semi-Inclosed Transformers

A complete line of semi-inclosed track transformers used for feeding track circuits in connection with railway signaling and varying in capacities from 5 to 250 volt-ampere 25 cycles and from 5 to 500 volt-ampere, 60 cycles has been placed on the market by the Union Switch & Signal Company. These transformers, as shown, are of the shell type and are arranged for mounting on either a shelf or wall. Those of the lesser



SHELL-TYPE TRANSFORMER FOR RAILWAY SIGNALING

capacities are equipped with standard Railway Signal Association porcelain terminal blocks which bear 14-24 binding posts. Those of the greater capacities are equipped with single terminal boards of treated maple, slate or porcelain, also bearing the standard 14-24 Signal Association binding posts. These transformers are arranged with the requisite number of primary and secondary taps to take care of track circuits of varying lengths and leakage resistances, as well as for signal lighting.

### Railways Use Calculating Machines to Increase Office Efficiency

The amount of both routine and complicated calculations made in railway engineering and accounting offices is constantly increasing owing to the careful records which are kept of the operations of the workmen, the performance of apparatus and the expenditures of the company. In order that the economies effected by accurate records may not be wiped out by the increased cost of clerical work, it is advisable to do as much calculating as possible by mechanical means.

The Monroe computing machine is being used by a score of the leading railways of the country, and is adapted to this service. It has a standard adding-machine keyboard for setting up the numbers involved in the computation, a crank for performing the operations, and a carriage holding the dials which show the results and the proof of the operations as they are completed. The operations of the machine are accomplished by a forward turn of the crank for addition and multiplication and a backward turn for subtraction and division. No special training is required to operate the machine.

The Tri-City Railway, Davenport, Iowa, has installed watt-hour meters in eight of their cars for the purpose of checking up the operations of the motormen. In the office of the transportation department the mechanical calculating machine is used in adding up the total miles run by each motorman and the corresponding total kilowatt-hours of energy used. From these quantities the kilowatt-hours per car-mile are computed.

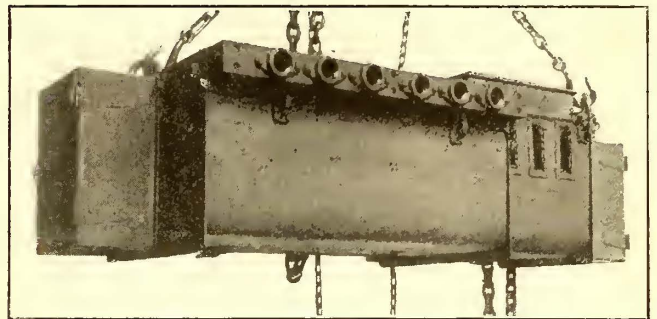
The accompanying table shows how these computations are tabulated. Assuming that the motormen are subject to the same operating conditions, the quantities in the last column indicate the relative efficiencies of the men.

| Motormen          | Total Miles | Total Kilowatt Hours | Kilowatt Hours Per Car-Mile |
|-------------------|-------------|----------------------|-----------------------------|
| 1—B. Geertz ..... | 928         | 2,105                | 2.268                       |
| 2—Hoffman .....   | 531         | 1,280                | 2.410                       |
| 3—Guenther .....  | 1,036       | 2,520                | 2.432                       |
| 4—Schroeder ..... | 228         | 585                  | 2.565                       |

### A New Low-Floor Car Control

The increased use of low-floor cars as a means of reducing the unloading and loading time element has necessitated the development of several kinds of apparatus, among the more important of which is the control. A controller box which, together with a master controller, control switch, grid resistor, main fuse and the necessary interconnecting cables, constitute a complete equipment for this type of car, and which is known as the HLD control, has recently been placed on the market by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

The controller box, shown in the accompanying illustrations, is divided into compartments, one containing three switches or circuit breakers, one containing the reverser and commutating switch and two small end compartments housing the motor cutout switches, relays and control terminals. While the maximum depth

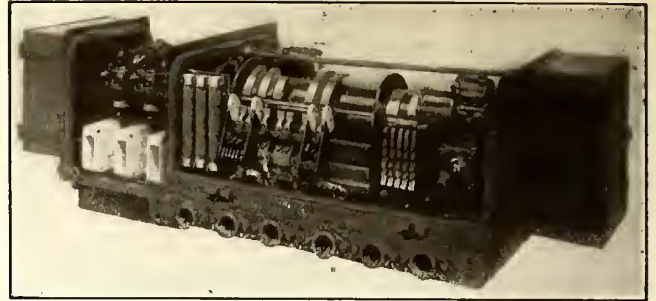
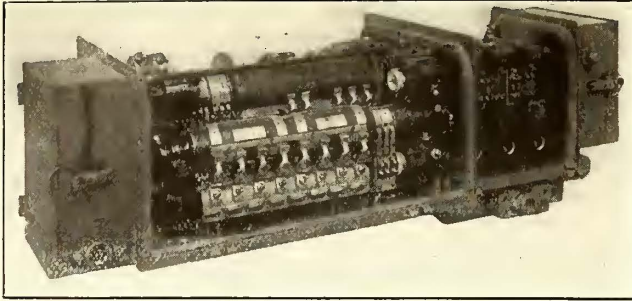


CONTROLLER BOX INCLOSED AND READY FOR MOUNTING

is over 17 in., this occurs only above the switch compartment, the top of which is only 14 in. square and extends between the sills, so that the effective depth beneath the car sills is only 14½ in.

The principal changes in main motor circuit connections, as well as the application and shutting off of power and the overload tripping features, are accomplished by three independent electric-pneumatic switches. These switches are of the HL type, which are provided with magnetic blowout. The minor changes in motor circuit connections, as required to accelerate the car, are accomplished by means of a drum type PK switch. The direction of motion of the car is controlled by a pneumatically operated reverser.

The operation of the car or train is governed by a master controller which controls the operation of the magnet valves and thus directs the movement of the switches, drum, and reverser, and regulates the operation of the motors. One master controller is located in each cab. Compressed air for operating the switches, drum, and reverser is obtained from the air-brake system through a reducing valve. The power for operating the magnet valve is taken from the line voltage through a suitable resistor. The circuits from the master controller are carried to a multi-conductor train



FRONT AND REAR VIEWS OF CONTROLLER BOX WITH COVER REMOVED SHOWING DETAILS

line from which branch circuits are run to each piece of apparatus. This train line extends the entire length of the car and terminates in receptacles at each end. The train line of any car may be connected to that of any other car at either end by means of a jumper placed in the adjoining receptacles, thus making the train line continuous throughout all cars. Operation of the master controller on any car will then operate the respective pieces of apparatus on all cars simultaneously.

The control circuits for the unit switches, operating drum and reverser are so interlocked that the sequence of operation is predetermined and the action of one part can take place only when the other parts are in their correct relation. By means of a series limit switch, the acceleration of the car may be made automatic, thus preventing excessive overloading of the motors. However, each notch in series is registered on the master controller, so that the progression of the control may be arrested at intermediate speeds when desired. The second notch is secured at will, independent of the limit switch.

Where the service requires, a compound limit switch may be supplied whereby a momentary increase above normal current may be secured by closing a push button. The master controller handle may be provided with an emergency cutout attachment, which operates contacts in the control circuit supply, and may also be arranged to apply to the brakes. The handle must be held down continuously while operating in order to maintain power on the motors.

All arcing is confined to the pneumatically operated unit switches which are designed to effectively care for this duty, leaving less attention necessary to be paid to the drum contacts as compared to that required for a standard platform controller.

This control, while primarily designed for light-weight, low-floor cars, is capable of handling two or four motors having an aggregate capacity of not over 200 hp. at 600 volts. Among the more important advantages of this low-floor car control are the following: compactness, reliability, ease of installation, light weight, low maintenance, safety, and simplicity.

### Scrap Axles Used for Forgings

The Kansas City Railway up to the time of the prevailing scarcity of forged steel, made it a practice to purchase old steam railroad axles for use in the manufacture of forgings. These axles were bought at an average price of \$20 per ton, whereas billets at that time cost from \$27 to \$28 per ton, f.o.b., Pittsburgh, Pa. These old axles contained a high carbon steel, which, if purchased by formula, would have cost the company approximately \$35 a ton. The carbon content of these axles is 0.30, which makes them a very satisfactory material for the manufacture of high-grade forgings.

### Improvements in Standard Truck Construction

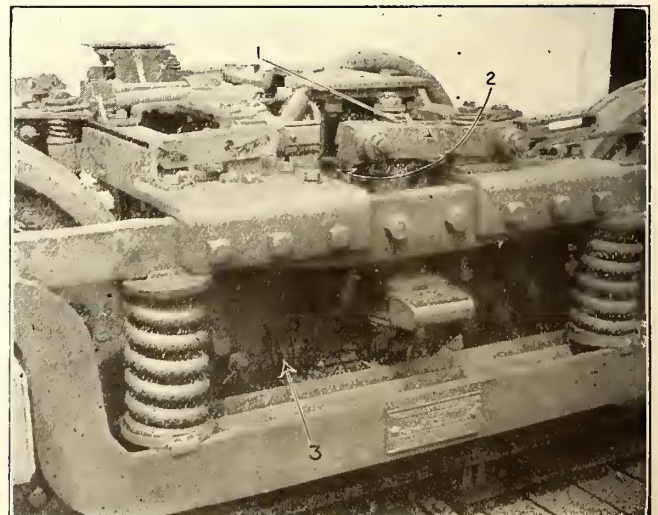
Three very important improvements in Brill truck design recently have been perfected and installed as standard on the various Brill trucks to which they are applicable. They are the side-swing dampener, the graduated spring system and the bolster guide.

The graduated spring device now is incorporated (unless otherwise requested) in the construction of all Brill motor and trail pivotal trucks, and the bolster guide is a standard part of all motor pivotal trucks. Preference is given to the block and link type of guide shown in the accompanying illustration, but in some cases there is not sufficient space to install this type, and in those cases a ball and link type is employed.

In detailing the construction and action of these new devices (which form a very important part of the Brill exhibit at the American Electric Railway Association convention, at Atlantic City), a specific type of truck, the 27-M.C.B., is taken.

When the car is running free, without any effect from the brakes or acceleration of the motors, both the elliptic and the equalizing springs are free to act to cushion the car. However, in a truck of this type, not equipped with the bolster guide, when the brakes are applied the springs cease to act to a greater or less extent. This is due to the fact that when the shoes are forced against the wheels they cause the axles to spread apart and consequently press the journal boxes against the sides of the pedestal. This pressure in most cases is great enough practically to stop the action of the equalizing springs.

In order to overcome any undesirable vibration, which might extend up into the car and set up injurious



27-M.C.B TRUCK SHOWING (1) BOLSTER GUIDE; (2) SPIRAL SPRINGS FOR SPRING SYSTEM, AND (3) SIDE-SWING DAMPENER



jars and shivers through the frame of the car with the result of decreasing the length of its life, the bolster guide was designed. This device entirely replaces bolster and transom chafing plates. Its purpose is to link the bolster to the transom in such a manner that the spring action will give the bolster a vertical movement, and also that the bolster may move transversely of the truck for easement on curves. The links, however, hold the bolster in such a position that it cannot approach or move away from the truck transoms, and, therefore, since the bolster and transom or truck frame never are in frictional contact, the former practically floats on the springs and well may be termed a floating bolster.

Due to the bolster guide link being pivoted on both the bolster and the transom, the vibration in the truck frame is lost in the link, which moves up and down quickly at the end attached to the transom and merely revolves slightly on its bolster pivot, giving the car the full benefit of the action of its springs under braking and acceleration, when the spring action really is needed more than at any other time to produce smooth riding.

In trucks of the M. C. B. type which do not include as a part of their construction the graduated spring system, the elliptic springs have to be made sufficiently strong to carry the car's maximum load, in some cases more than 150 passengers. It is easy to see that a spring heavy enough to carry a load of this size would not produce the best results when only a few passengers are occupying the car. The capacity load is the exception rather than the rule, a lightly loaded car being more common, and therefore it seemed but natural to endeavor to devise some means of providing easy spring action and smooth riding under the more frequently occurring light load. This system consists of a spiral spring mounted between the top of the elliptic spring and the truck bolster. The capacity of this spiral spring is less than that of the elliptic; in fact, it is of such strength that after the seated load is in the car the bottom part of the pocket on the truck bolster contacts with the spring seat, and from that point on any additional load is borne by the elliptic spring only. Thus the spiral spring remains out of action until the passenger load again is less than the seated load, at which point it again becomes active. Thus easy-riding qualities of the truck under light passenger loads are assured.

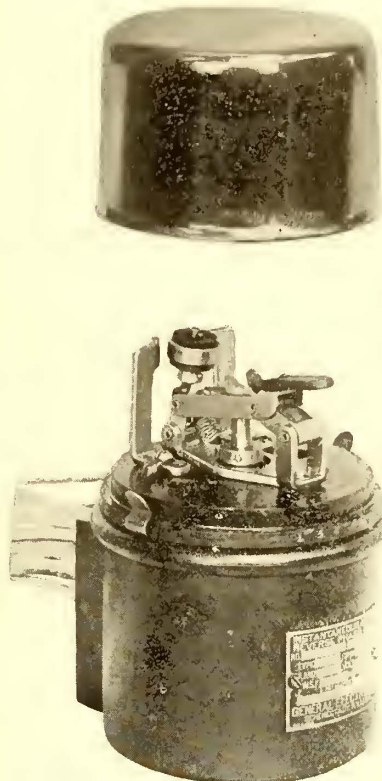
The above descriptions show how the vertical motion of the car is taken care of by the graduated spring system and the bolster guide. However, even with the vertical motion of the car corrected so absolutely by the combination of these two devices, there remained another disadvantageous feature to be cared for. This was the side swing set up in the car in taking curves or in passing over bad irregularities in the track, which swing in many cases had a propensity for becoming very intense. This swing, before the perfection of the side-swing dampener, was possible because the upper end of the links, by means of which the elliptic springs connect the truck bolster and the transoms, are hung so that the whole link will swing sidewise under the necessary force. To check this lashing back and forth, a fairly heavy spiral spring is placed in compression at the end of the bolt supporting the casting upon which the bottom of the elliptic spring rests. The compression of this spiral spring forces the hanger link against the casting upon which the elliptic rests and sets up a friction, the amount of which can be regulated by more or less tension to suit the condition of the roadbed so as properly to handle the side swing. Thus, with this dampener installed on the truck the side swing is taken care of simply, but efficiently.

## A Recent Design of Reverse-Phase Relay

The General Electric Company, Schenectady, N. Y., has just placed on the market a new reverse-phase relay which is shown in the accompanying illustration.

This relay was designed for the protection of apparatus against accidental phase reversal caused by the interchanging of wires when repairing cables or installing additional switching apparatus. It is specially applicable for two conditions: first, where the motor operates normally in one direction only, and, second, where the motor, under normal conditions, operates in either a forward or a reverse direction by changing the phase rotation with a controller. In the first case the relay is installed as near the motor as possible, so that when current is thrown on the motor under unintentional reversed-phase conditions, the relay operates, opens the motor switch and automatically cuts out the motor from the circuit. In the second case the relay is connected outside of the controlling apparatus of the motor, and affords protection for reversals of phase between the controlling apparatus and the source of power supply.

This relay operates on the same principle as a squirrel cage induction motor. The operating coils correspond to the stator, and a hollow aluminum cylinder, connected to the contacts, corresponds to the rotor. The cylinder or plunger does not rotate, but moves in a straight line, either up or down, depending upon the phase rotation. When one of the phases of the



REVERSE-PHASE RELAY WITH COVER REMOVED SHOWING OPERATING MECHANISM

line is reversed, the plunger moves and operates the circuit-opening or circuit-closing contacts. Both sets of contacts are equipped with toggles so arranged that there is no tendency for the contacts to open or close until the toggle has buckled, the contacts then being quickly thrown to the desired position. The type of contacts required for any installation will depend on the method of tripping out the motor switch. When contactors alone are used, circuit-opening contacts are recommended. The circuit-opening contacts are reset by hand. Circuit-closing relays are used in connection with a shunt trip on air or oil circuit breakers.

These relays are designed for two-phase or three-phase service with either current or potential windings, depending upon the amount of current and the voltage of the current. Current windings, which will cause the relays to operate on phase reversal at 70 per cent of normal current, are supplied for the following conditions: for circuits up to and including 100 amp. and 550 volts, connected in series with the line; for circuits

above 100 amp. up to and including 550 volts, connected in the secondaries of current transformers, and for circuits of 600 volts and above at all currents, connected in the secondaries of current transformers. Potential windings are supplied for circuits up to and including 550 volts, connected directly across the line and for circuits above 550 volts connected to the secondaries of potential transformers. These coils are furnished with external resistances of the proper value for the different voltages.

## Control Equipment of New Toledo Cars

Safety, Economy and Adaptability Were Considerations in the Selection of this Equipment

Elsewhere in this issue appears an abstract of an article by C. A. Brown giving the reasons for the selection of train control for the Toledo Railways & Light Company, Toledo, Ohio. The new cars are equipped with Westinghouse light-weight HLF control and are arranged for single-end operation. They can be operated as single cars, or several cars can be operated in train. The cars are equipped with bus lines so that all trolley poles need not be raised.

Interconnected with the control system is a door interlock automatically preventing starting until all doors

may occur when the controller is notched off, thus insuring a maximum life of switch contacts and arc box sides.

The connections of the rear signal light system with the main circuits are shown in the second diagram. When the car is standing still the circuit is completed through a red light by the resistance which shunts the No. 2 motor fields. This resistance is high in comparison with the resistance of the motor field and, therefore, does not interfere with the normal operation of the motors. During series running a green light burns also on account of closing the LS switch. During parallel running the potential across the red light, is reduced to zero, which extinguishes the red light, but the green light, being directly across the line, still burns.

The brake equipment is of the Westinghouse straight air type with an automatic emergency feature. It is possible for the conductor to set the brakes in emergency, if conditions require, through a conductor's valve. The motor-driven air compressor is of the "bungalow" type.

## Brake Lever Strut for Slack Adjusters

The Smith-Ward Brake Company, New York City, have recently developed several types of automatic shim slack adjusters to meet the requirements of the different types of trucks in service, such as Brill 27-G, Standard 0-50 and Taylor S-B.

It was desired to make a form of strut that could be used under practically all conditions, one that was light but strong, and while easily adjustable, was as free from wear, tear and rattle as could be made. The brake lever strut, shown in the accompanying drawing, has been brought out to meet these conditions. It has only two bushings, these being inside the brake lever

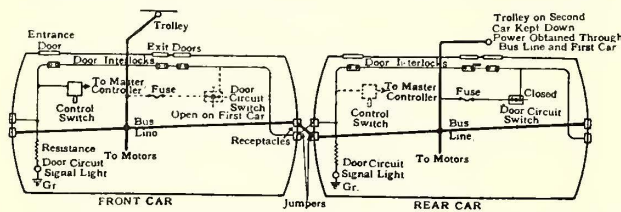
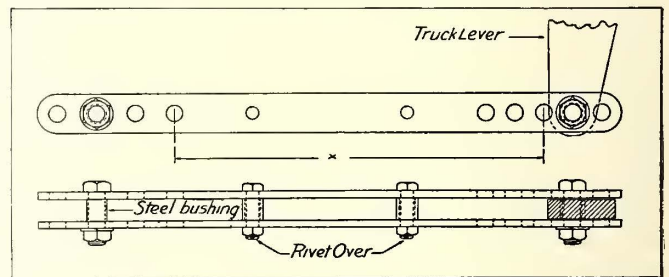


DIAGRAM OF CONNECTIONS OF DOOR INTERLOCK CIRCUIT

are closed. There is also a rear light signal indicating whether the car is standing still, starting or moving.

The connections of the door interlock circuit are shown schematically in one of the accompanying diagrams. The door circuit switch is closed only on the rear car, so that the current for the contact passes through all the door interlocks of the train in series to the master controller on the first car and thence to the control circuits. This arrangement allows the controller to be placed on the first notch as soon as the car stops, so that the car will start immediately when all the doors are closed. A signal light is also provided near the controller which, by lighting up, tells the motorman when all the doors are closed.

A slip ring is provided on the master controller which causes several of the important circuit-making



BRAKE LEVER STRUT FOR USE ON STANDARD TRUCKS

bushings and in the strut. The wear is transferred from the pin to the bushing, hence the bolt replacing the pin is free from wear. If desired, it can be adjusted in 1/2-in. steps to allow for shoe and wheel wear and can be used instead of a turnbuckle if one cannot afford slack adjusters. It can be made lighter than the present struts, being riveted together and made on the principle of a built-up girder and not simply held together by the two spreaders. According to the claims of the maker, this brake lever strut is cheaper to buy in the first place and then cheaper to maintain than others.

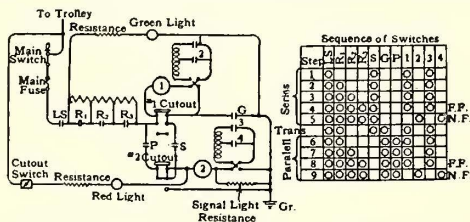


DIAGRAM OF MAIN CIRCUIT AND REAR-END SIGNAL LIGHT

At standstill the red lamp burns brightly and the green lamp is out. On the first notch the green lamp lights up and stays lit as long as power is on. As the main resistance is cut out the red light becomes dimmer; at the full series position it gets half voltage; at full parallel it is shunted out by the main circuit.

switches to open simultaneously whenever the controller handle is moved one notch toward the off position. This distributes among several switches any burning that

The Ottumwa Railway & Light Company, Ottumwa, Iowa, is testing out a Collins non-splashing type electric track switch at the intersection of the Jefferson and Court Streets car lines in Ottumwa. The switch is connected so that the Court Street car motorman turns the switch his way by shutting off power and coasts through, while the Jefferson Street car motorman goes through with power on. If the tests are successful it is anticipated that others of the same type will be installed on the company's lines.

## LONDON LETTER

**Proposal Made to Curtail Glasgow Night Service—Plan to Remove Embargo on Electric Vehicles—Electric Train Service on the North London Railway**

*(From Our Regular Correspondent)*

A proposal has been made by the Glasgow Corporation Tramways committee to curtail the car service at night by an hour. The reason given is the scarcity of labor and the consequent strain on the department, which will be accentuated if the attested men still in the service are called to the army. At present nearly 600 of the traffic staff are working seven days a week. It has also been agreed to recommend that, for the duration of the war, the working hours be fixed as follows: Drivers and conductors, fifty-four hours a week; controllers and truckmen, fifty-four hours; sawyers and wood cutters, fifty-four hours; permanent-way laborers, fifty-six hours; mains and cables (laborers), fifty-six hours; red-leaders, fifty-six hours, and car works (laborers and handymen), fifty-four hours. It has also been agreed to recommend that these employees be paid time and a half for the extra hours worked between the present weekly total of fifty-one hours and the proposed working week. Another recommendation which has been adopted is that during the war male employees in the classes referred to receive a bonus of 2s. a week and female employees a bonus of 1s. a week.

Correspondence has taken place between the Board of Trade and the electric vehicle committee of the Incorporated Municipal Electrical Association with regard to import restrictions. The secretary of the committee wrote to the Board of Trade on July 7 pointing out the increasing adoption of the electric storage battery vehicle for commercial purposes, and asking that the import restrictions upon commercial vehicles be waived in respect to storage battery vehicles owing to the impossibility of obtaining such vehicles of British make. The effect upon the electric supply industry was pointed out, as was the simplicity of control of such vehicles, which enables men of military age to be released for service with the forces, as women or elderly men can become proficient in driving after but a few hours' tuition. It was pointed out also that there is at the present time only one British firm making the heavy type of commercial electric vehicle now in such demand, and it is understood that they are quite unable to cope with the orders coming to them, as they have but recently taken up this line of manufacture and are heavily involved in the production of munitions of war. It was therefore asked that there should be free importation at the present time of American-built commercial electric vehicle chassis. The Board of Trade replied on July 11 to the effect that if the committee would send a statutory declaration to the effect that the chassis it was desired to import are to be used solely for commercial purposes, the matter of their importation should have consideration.

On Oct. 1 electric train service was to commence on the North London Railway and its connections, which constitute through routes from Broad Street to Richmond and to Kew Bridge, via Hampstead Heath and Willesden. This is the first instalment of a more comprehensive scheme undertaken by the London & North-Western Railway, which includes the electrification of the lines from Euston and Chalk Farm to Watford. A small section between Queen's Park and Willesden has been in operation over a year, serving as an extension of the Bakerloo Tube, and the North-Western trains between Willesden and Earl's Court have been working electrically for more than a year. When the project is completed passengers from Watford and intermediate stations will have frequent and speedy services, with the choice of Broad Street, Euston, or the stations of the Bakerloo Tube as London destinations, so that the city and West End will be equally accessible. Between the heart of the city and Richmond a forty-minute journey without change and entirely in the open will compare favorably with the routes by the Waterloo and the City & South-Western lines, involving a change, and by the District, which is underground for a great part of the way.

The experts recently asked by the Corporation of Edinburgh to make a report on the future working of the tram-

way system in that city have stated that they propose to submit a full report in the near future. In the meantime, they have prepared a report on the methods of traction that might be adopted, keeping in view probable future extensions. The experts who were selected by the Edinburgh Corporation are: J. B. Hamilton, general manager of the Leeds Corporation Tramways; J. A. Brodie, city engineer of Liverpool, and A. H. Campbell, city engineer of Edinburgh. The chief point on which the experts were asked to report was whether it was practicable to arrange for a system of traction other than the cable so that it might become operative immediately on the expiration of the lease to the tramways on June 30, 1919. This question is answered in the affirmative, and the interim report adds that the corporation might proceed with its arrangements independently of the tramways company. Another important question asked was whether it would be advisable to adopt a new system of traction for some of the routes, retaining the cable for other routes, to which the interim report makes reply that it is desirable to have only one system. Another question asked was whether the electric system could be operated in such a way that there would be no overhead wires in the central parts of the city. The objection to overhead wires has all along been the chief reason that other systems have not been adopted. The experts reply that such an arrangement would be possible, but that it could not be put into operation immediately on the expiration of the lease, as the excavation for a conduit system would require considerable preparation and would involve interference with the running of the cable cars. It is suggested in the report that the overhead system might be introduced temporarily.

A report of the Portsmouth Corporation Tramways for the year ended March 31, 1916, has been issued by the general manager. Owing to so large a number of motormen and conductors joining His Majesty's forces, and the impossibility of obtaining suitable men to act as motormen, the car service in September, 1914, had to be reduced. Women conductors were introduced on the cars in June, 1915, but this did not overcome the difficulty of obtaining a sufficient number of motormen to improve the services, as others were still being lost, and all the male conductors, who were eligible to act as motormen, had not been trained for this position. It was not until March, 1916, that it was possible to make any improvement. At that time service during the afternoons and evenings was restored in full. The traffic revenue for the year shows a substantial increase over that of the previous year, despite the fact that considerably less mileage was run. The committee decided on July 20, 1915, to increase the bonus paid to motormen and conductors whose conduct had been satisfactory from 10s. a man each half-year to 30s. a quarter, the women conductors to receive a bonus of 10s. each half-year for general good conduct and freedom from reports.

In order to economize the coal consumption in and around London, it has been suggested by the Board of Trade that the many electrical companies should link up. A committee has been formed on which sit representatives from most of the undertakings. The body has held a number of informal meetings, and it is expected that a scheme will be formulated shortly. In the East End some of the municipal supplies are already linked up. It is said that a thousand tons of coal are being saved annually through the linking up of the Stepney and Poplar supplies. In addition to the fuel saved, there is the saving in machinery. In the case of electric railways linking up is already provided for, at least sufficiently to overcome part of the difficulty which would arise from a breakdown, though one station might not be able to supply the full demands of another added to its own load. But there are also a number of power stations operated by railways for lighting and crane and lift power, and therefore among the concerns mentioned as parties to the conference above noted are the Great Eastern, the London & South-Western and other railways, though the proposal concerns railways only incidentally.

At a recent meeting of the Leeds City Council the question of a war bonus for women conductors on the tramways was discussed. The annual cost of the increased war bonuses amounted to £8,000 or £9,000, and in spite of opposition the increased war bonus as proposed by the general purposes committee was adopted.

A. C. S.

# NEWS OF ELECTRIC RAILWAYS

## ATTEMPT TO STAMPEDE ATLANTA EMPLOYEES

Effort Made to Intimidate Atlanta Men and Coerce Them Into Going on Strike Fails

The Georgia Railway & Power Company, Atlanta, Ga., resumed operation of its railway lines on the morning of Oct. 3 on regular schedules in and around Atlanta, after having suspended service and ordered all cars to the carhouses at 6.30 p. m. on Oct. 2, following an attempt to stampede a strike among its men. The cars are being operated by regular employees. The company maintains that there is no strike in the true sense of that term, that rioting and other violence and the threats and other forms of moral intimidation directed against the men and the cars are the work of a lawless element which in the main has no relation even to organized labor. This element is composed almost entirely of outsiders, but includes some former employees discharged by the company during a preceding period of time and a majority of a hundred or more former electric linemen who went on strike two months ago. The linemen were unsuccessful in their attempt to coerce the company, but developed their case into the present agitation. Leading the agitators is a paid organizer of the International Brotherhood of Electrical Workers, who is quoted as saying he has been delegated by the Amalgamated Association to further its interests in Atlanta. The issue lies clearly on the one hand between those who aided and abetted by the lawless and unattached element of the city would force the carmen against their will to join the street railway union, and on the other hand the company, its men and the law-abiding public. The company's men have resisted so well all efforts to coerce them that the sole factor which governs the company's ability to render adequate service is that of sufficient protection against rioters.

At 6 p. m. on Sept. 30 without previous warning, the agitators succeeded in interrupting service temporarily by prevailing upon about thirty men to abandon their cars in the downtown section. The interruption lasted only five minutes in the longest instance. The company was prepared with reserve men from the regular forces to resume traffic at once. Rioting followed and resulted in a number of men being pulled forcibly from their cars. In the interest of the safety of its men and passengers the company finally suspended service for the remainder of the night. Service was resumed on regular schedule Sunday morning, but the rioting in the downtown sections was resumed and again was not stopped by the police. On this account at about 10 a. m. service was suspended for the remainder of the day.

At a meeting of the city police commission Sunday afternoon, citizens protested against the attitude of the police, with the result that the commission directed the police to enforce certain ordinances which had been violated and coupled the direction with the warning that non-observance of these instructions by individual officers and members would constitute inefficiency and insubordination.

Service was resumed on Monday morning on regular schedule on all lines. Violence and other forms of intimidation on the outlying sections of three lines resulted in the curtailment of service on those lines about noon. At dark the sporadic rioting of the day in the outskirts of the city and its environs became general and increased rapidly in intensity. At 6.30 p. m. the company suspended service for the remainder of the night on all lines.

The lawlessness and disorder which characterized the attempt to stampede the men was condemned at a meeting of citizens called by the Atlanta Chamber of Commerce on Monday morning. Among the leaders at this meeting was Asa G. Candler, Mayor-Elect of Atlanta. The meeting resulted in the creation of an executive committee, the individual tender by every member of his service as deputy to the Sheriff of Fulton County, and an agreement to meet each day until the situation is remedied.

## SERVICE IN NEW YORK APPROACHING NORMAL

The week just passed has served to indicate more clearly the collapse of the New York strike. The companies have continued about their orderly work and are daily approaching more nearly to the schedules in effect before the men went out. In this work they have been helped materially by the repeal on Oct. 2 of the Mount Vernon experience ordinance. This ordinance and the similar ones in effect in Yonkers and New Rochelle since 1913 hampered the companies greatly. The amendment repealing the fifteen-day experience ordinance in Mount Vernon was passed by a vote of eight to one. The Third Avenue Railway promptly resumed service in Mount Vernon following the repeal of the measure.

In Yonkers and New Rochelle the experience ordinances still stand. As a result no cars are being run there. In order to show its ability to give service in Yonkers, however, the Yonkers Railroad on Oct. 2 manned some of its cars with starters who had more than the fifteen days' experience specified in the ordinance and started operation. The disorder that followed caused the company to withdraw the cars in the interest of the safety of its patrons. There were also repeated attacks on cars in Mount Vernon. The repeal of the ordinances in these cities is being agitated. In New York City the cars are still under police protection and the wire screens which were put over the entrances to the cars at the beginning of the strike are still up.

The attempt at a sympathetic strike failed dismally. The time for calling this strike was put off and put off. When it did come on Sept. 29 some 12,000 men in other trades are said to have responded to the call. Most of these men had grievances of their own and probably would have gone out to enforce their individual demands. One of the exceptions, however, was among the workers in the breweries. These men returned to their jobs after being out twenty-four hours.

## ANOTHER INCREASE IN WAGES IN BALTIMORE.

Following the monthly meeting of the directors of the United Railways & Electric Company, Baltimore, Md., on Sept. 27, William A. House, president of the company, announced that the board, in recognition of the continued loyal and efficient services rendered by its motormen and conductors, authorized an increase in the rates of pay of these employees, effective on Oct. 1. Employees in several of the other departments will receive similar consideration. This is the fourth increase in the wages of employees of the railways since 1912. The schedule of increased pay is as follows:

Class No. 1 will comprise men who have been in the service less than one year, and will be paid 24 cents an hour.

Class No. 2 will comprise men who have been continuously in the service more than one year and less than two, and will be paid 25 cents an hour.

Class No. 3 will comprise men who have been continuously in the service more than two years and less than three, and will be paid 26 cents an hour.

Class No. 4 will comprise men who have been continuously in the service more than three years and less than five, and will be paid 27 cents an hour.

Class No. 5 will comprise men who have been continuously in the service more than five years, and will be paid 28 cents an hour.

The directors at the monthly meeting in June authorized the inauguration of a death benefit or insurance plan, to the privileges of which employees are eligible without any outlay whatever on their part, the entire expense being borne by the company. In 1914 the company also established a pension system, under the provisions of which employees retiring after a stated period are pensioned for the remainder of their lives. The company also stands the expense of this pension plan.

## SHORT STRIKE IN ALBANY

## Question of Discipline Involved—Men Finally Accept Terms of Settlement Previously Rejected

A strike of the employees of the United Traction Company, Albany, N. Y., was declared effective at 5 a. m. on Oct. 2, by the local Amalgamated Association as a means of forcing the company to meet demands of the men with respect to how the company should deal in a particular matter of discipline. On Oct. 4 the strike was declared off after an agreement had been reached to arbitrate the question in dispute.

When it became apparent that the good offices of the representatives of the company could not dissuade the men from going out the company issued a statement reviewing the history of the controversy. As previously stated the question at issue was one of discipline. The company's statement to the public follows in part:

"The only point we refused to concede was the right to discharge an employee who had willfully violated the rules and had gone by a safety stoppage point at between 25 and 30 m.p.h., narrowly missing an automobile in which were three citizens of Albany. For the safety of the public there must be rules of this nature; for the safety of the public the men who violate these rules must be disciplined. We have no desire to discharge competent and careful men; they are assets of the company; it costs money to train them and develop them; but where a man is found who is proved by reputable witnesses to be doing things that endanger the lives of citizens we claim the right to dismiss him in the interest of the public, and ask the public to stand back of us in what seems to us a most reasonable stand.

"Let the public remember this is no strike for wages. We pay high wages, wages that compare favorably with those of any other traction company in the United States and Canada. There is no complaint about working conditions. The point at issue is, shall we be forced to keep men who operate cars with reckless disregard of the rights of the public? We offered to arbitrate the matter in dispute by referring the question to the Public Service Commission. This was refused. Mr. Droogan (president of the local union) suggested instead the arbitrators who adjusted the difference of a year ago, and we gladly accepted this suggestion, but even this concession was not sufficient to avoid the strike."

The difference between the men and the officials was over section 6 of the agreement between them. The men complained they were punished for offences in a manner outside of the meaning of section 6. The company agreed to arbitrate on the specific cause, but refused to arbitrate on section 6. The men wanted a board of arbitration to pass on the meaning of the entire section, which they say is clouded.

The meeting on Oct. 4 at which the agreement to arbitrate was reached was called by the State Mediation Board. At the suggestion of Mayor Burns of Troy the officials of the company agreed to enter into the discussion of the strike with the representatives of the men. At this conference the men agreed to arbitrate, first, whether or not section No. 6 of the working agreement between the parties had been violated in handling the case of Motorman Michael J. Hurley; second, whether or not the case of Motorman Michael J. Hurley was adjudicated fairly by the officials of the company. This is the same offer that was made to the men at a conference on Sept. 29 in the office of the company. It was at that time refused and an ultimatum served on the company that a strike would follow in forty-eight hours. The signed agreement which formed the basis of settlement of the strike reads, in part, as follows:

"At the conference an agreement was reached that the following questions would be submitted to a board of arbitration, namely:

"Whether or not section 6 of the working agreement between the parties has been violated in handling the case of Motorman Michael J. Hurley;

"Second, whether or not the case of Motorman Michael J. Hurley was adjudicated fairly by the officials of the United Traction Company; and

"The following named gentlemen were selected to comprise the board of arbitration: Cornelius F. Burns, Mayor, city of Troy; Lynn J. Arnold, William E. Woollard; and that the strike be declared off and operations be resumed as soon as possible."

## BOSTON ELEVATED APPEALS TO EMPLOYEES

In connection with the presentation of its appeal for additional net revenue to a special legislative commission, the Boston (Mass.) Elevated Railway has sent a copy of its printed statement to every employee of the company, to all stockholders, heads of municipal governments in its territory and to city and town solicitors, to public service commission and college libraries, officials of local improvement associations, state officials, prominent engineers, railroad presidents, and union officials. Accompanying the statement sent to employees in each case was a letter signed by Matthew C. Brush, president of the company, expressing thanks for loyal support, emphasizing the benefits of team-play, and calling attention to the difficult financial situation now confronting the company, the investigation under way by a special commission and outlining the importance of the company's statement. The letter to the employees, dated Sept. 28, follows:

"I want to thank all the employees of the company with whom I have had any dealings for the past three years for their cordial, loyal support and co-operation, and hope that I may in the future know all the employees better than in the past.

"The success or failure of any enterprise must not only necessarily reflect credit or discredit on each and every employee, but must revert in the same proportion to the advantage or disadvantage of all. It is absolutely impossible for any man by himself to make a success of his work, and therefore the success of all of us lies in each and every employee recognizing the importance of team work and working with the common interest of all at heart.

"The public is very apt indeed to judge the company by the attitude of the employees with whom it comes in daily contact, and the courteous consideration of the car riders by all employees will go a long way toward placing the company in a proper and favorable position in securing the consideration and co-operation of our patrons which is so essential to the success of all of us.

"It is my desire to assist each and every employee of the company to make a success of his position. The difficulties which lie immediately before us are of sufficient seriousness and magnitude to warrant the keen and conservative consideration of each and every employee and officer of the company as well as all citizens of Greater Boston.

"As you know, the company is presenting at this time to the commission, consisting of the Lieutenant-Governor of the State and others, all the facts in connection with the condition of our property, and is forwarding to each stockholder of the company a copy of the statement which has been presented to the commission; and, assuming that each and every employee must be equally interested in the success of the company, we are inclosing herewith a copy of this same statement. I sincerely trust that every employee will read the statement carefully and to the extent that he sees fit permit others to read it.

"We all have three interests to conserve and protect: the investors', who have supplied the funds to make the physical property possible; the employees', whose wages must be provided and who render the service; and the car riders', who furnish the income; and I sincerely hope, and have every reason to believe, that all officers and employees will conscientiously bend every effort toward making our community justifiably proud of our transportation system, and as near a model street railway as is within our power."

## INJUNCTION AGAINST STRIKE IN MISSOURI

A temporary injunction to restrain the motormen and conductors of the Springfield (Mo.) Traction Company from striking was granted in Kansas City on Sept. 28, by Judge Arba S. Van Valkenburgh of the United States district court. The strike was scheduled for midnight on Sept. 29, at which time more than 50 per cent of the conductors and motormen were to walk out, according to the report. The threatened strike was the result of the discharge of Stanley Jones, secretary of the local carmen's union and a conductor on one of the company's lines. Jones was discharged for alleged violation of the company's rules. Following the discharge of Jones, arbitration of the matter was requested and refused, on the grounds that it was not a matter for

arbitration. Following this, the strike was called. The injunction restrains the carmen, J. H. Bisplinghoff, president of the union, and Stanley Jones, the secretary, from calling a strike, threatening a strike or inciting a strike, or striking. The grounds for the restraining order were that the strike was a violation of the agreement between the company and the union and that such a strike would seriously handicap the company and would jeopardize its franchise.

The title of the petition was the Guaranty Trust Company, New York, a corporation, and J. G. Bodell, against Division No. 691 of Springfield, Mo., of the Amalgamated Association of Street & Electric Railway Employees of America and J. H. Bisplinghoff, president, and Stanley H. Jones, secretary. The petition cites that the franchise of the Springfield Traction Company calls for the operation of cars on certain schedule time and that any failure to so operate will jeopardize the franchise and such failure to operate would afford grounds for proceedings to forfeit the rights and franchise of the company. The petition then brings in the facts which have brought about the present situation, as presented by the company:

"That Stanley H. Jones is secretary of the division No. 691 and that for weeks, in violation of the rules and the regulations of the company, persistently and continuously refused to wear the uniform of a conductor; sat among the passengers while on duty; refused to call the names of the streets; on several occasions left his car, while on duty, and rode on another car, which after making a trip, could meet the car he belonged on."

It is also alleged in the petition that Jones has admitted many of the violations. The petition sets forth that on Sept. 14, the company discharged Jones; that on Sept. 15, he requested an arbitration of the matter; that on the next day he was informed by the company that it was not a matter of arbitration; that Jones and Bisplinghoff called on the division for a strike; that the division has voted a strike and is about to declare a strike, and that unless the restraining order is granted, the division will strike. It is further set forth that the object of the strike is to nullify the contract between the company and the division.

A. F. Van Deinse, general manager of the company, is quoted as follows:

"The position of the company in this matter has always been that it has a legal and binding contract with the union, the provisions of which the company has always observed and intends to observe in the future and that the company believes that its employees should do likewise. This contract gives to the company the option of suspending or discharging any employee for the violation of any rule or regulation, and the company had discharged an employee for the violation of a number of rules on several occasions, and therefore the company held that the employee was rightfully discharged, inasmuch as he personally admitted the violation of these rules, and the company further maintains that after the employee's violation of the rules, the question of discharge was not one which could be arbitrated, and therefore the company appealed to the federal court for a writ of restraint, preventing the union from breaking its contract with the company."

#### BUFFALO FARE CASE AGAIN ADJOURNED

At the request of Thomas Penney, vice-president and general counsel of the International Railway, Buffalo, N. Y., the City Council on Sept. 29 again adjourned the hearing on the application of the corporation counsel for permission to start an action before the Public Service Commission in an effort to force the company to lower its fare on the Buffalo city lines from 5 cents to 4 cents. Mr. Penney branded the proceeding as merely a reprisal because of the company's efforts to have its special franchise assessment reduced. He denied that any excessive return on the investment was being earned by the company and refuted statements of witnesses who charged that the company had never paid sufficient taxes. Mr. Penney declared the company paid the city directly or indirectly every year more than \$1,500 for every car operated and that this year the company will pay \$250,000 in additional wages to employees. He added that for fourteen years the stockholders received no dividends. He said that a rate investigation would be very costly to the

city, and urged the City Council not to approve the recommendation of the corporation counsel.

Statistics were filed with the Council by the corporation counsel which tended to show that the net earnings of the International Railway, for the fiscal year ended June 30, 1915, were \$1,947,839, and a statement was made that if six tickets were sold for 25 cents the reduced income would be \$1,067,939, which, based on a valuation of \$17,000,000 for the company's property inside the city, would result in a return of 6.85 per cent. Other figures were filed with the Council by the city attorney with the assertion that with a 4-cent fare the railway could earn at least 7 per cent on a fair value for the properties inside the city.

In replying to the argument advanced by a witness to the effect that cheap fares prevail in Detroit and Cleveland, Mr. Penney said that 40 per cent of Buffalo city passengers were transfer passengers, thus materially reducing the average fare per passenger.

**Lecture Course on Public Utility Investment.**—The Wall Street Branch of New York University, co-operating with the American Institute of New York City, has just announced a course in public utility investment arranged as to place and hour to be convenient for active business men in the downtown district. The course will consist of thirty lectures, one each week, on Friday, beginning Oct. 6, at 25 Broad Street, New York, at 5.15 p. m. It will be conducted by Thomas Conway, Jr., Ph.D., professor of finance, Wharton School of Finance and Commerce, University of Pennsylvania, and will be an advance course, especially designed to be of service to men engaged in the financial field. Included in the course will be seven lectures on electric railways, the points to be considered being those of especial interest to the investment banker.

**Picnic of Grand Rapids Employees.**—The employees of the Grand Rapids (Mich.) Railway were the guests recently of President Benjamin S. Hanchett of the company on his home grounds, Lakewood, the force being divided so that all could attend. The men brought their families who were entertained and refreshed at the expense of the company. The number entertained on the two days was approximately 5000. The entertainment and barbecue were in charge of L. J. DeLamarter, secretary and treasurer of the company. Several yearling steers were provided for the roast. The players from Ramona were transferred from that stage to one erected at Lakeside. In the evening the dancers made use of Mr. Hanchett's ballroom. There were balloon flights, fireworks and such other accessories as go to help furnish a good time. The last day of the picnic chanced to be the thirty-second anniversary of Mr. Hanchett's connection with the railway.

**Work on Buffalo-Niagara Line Progressing.**—The International Railway, Buffalo, N. Y., expects to have the new fast double-track line between Buffalo and Niagara Falls completed and in operation by July 1, 1917. Between 600 and 700 laborers will be added to the construction gangs within the next few weeks and J. W. Mack, superintendent of tracks of the company, plans to have all fills made and right-of-way graded before snow begins to fall. Tracks have already been laid for part of the distance between Buffalo and Tonawanda and between North Tonawanda and La Salle. The longest fills for the elevation of the tracks, through Tonawanda and North Tonawanda have been completed and the company is now awaiting the arrival of steel for the bridges which will be erected at several points along the line. Owing to the difficulty experienced in obtaining steel for the bridges along the new line, the company has made application to the North Tonawanda Board of Public Works for permission to construct a temporary wooden bridge over Wheatfield Road.

#### PROGRAM OF ASSOCIATION MEETING

##### Electric Power Club

The Electric Power Club will hold its next meeting at the Homestead Hotel, Hot Springs, Va., Nov. 15-18. This club has as its members the officials of the companies which manufacture motors of all types. C. H. Roth, 1410 West Adams Street, Chicago, is secretary-treasurer.

# Financial and Corporate

## ANNUAL REPORTS

### Third Avenue Railway

The comparative income statement of the Third Avenue Railway, New York, N. Y., and its controlled lines, for the years ended June 30, 1915 and 1916, follows:

|                                            | 1916         |          | 1915         |          |
|--------------------------------------------|--------------|----------|--------------|----------|
|                                            | Amount       | Per Cent | Amount       | Per Cent |
| Operating revenue:                         |              |          |              |          |
| Transportation .....                       | \$10,837,076 | 97.3     | \$10,565,027 | 97.0     |
| Advertising .....                          | 80,000       | 0.7      | 95,250       | 0.9      |
| Rent of equipment .....                    | 18,386       | 0.2      | 16,470       | 0.1      |
| Rent of tracks and terminals .....         | 73,210       | 0.6      | 73,441       | 0.7      |
| Rent of buildings and other property ..... | 85,802       | 0.8      | 84,710       | 0.8      |
| Sale of power .....                        | 41,894       | 0.4      | 50,959       | 0.5      |
| Total operating revenue .....              | \$11,136,370 | 100.0    | \$10,885,859 | 100.0    |
| Operating expenses:                        |              |          |              |          |
| Maintenance of way and structures .....    | \$1,090,700  | 9.8      | \$925,973    | 8.5      |
| Maintenance of equipment .....             | 599,549      | 5.4      | 678,573      | 6.2      |
| Depreciation accruals .....                | *294,271     | 2.6      | 562,958      | 5.2      |
| Power supply .....                         | 731,597      | 6.6      | 779,458      | 7.2      |
| Operation of cars .....                    | 2,923,776    | 26.2     | 2,914,525    | 26.8     |
| Injuries to persons and property .....     | 659,197      | 6.0      | 602,798      | 5.5      |
| General and miscellaneous expenses .....   | 509,100      | 4.5      | 511,890      | 4.7      |
| Total operating expenses .....             | \$6,808,194  | 61.1     | \$6,976,179  | 64.1     |
| Net operating revenue .....                | \$4,328,176  | 38.9     | \$3,909,680  | 35.9     |
| Taxes .....                                | 848,122      | 7.6      | 731,034      | 6.7      |
| Operating income .....                     | \$3,480,054  | 31.3     | \$3,178,645  | 29.2     |
| Interest revenue .....                     | 157,870      | 1.4      | 81,127       | 0.8      |
| Gross income .....                         | \$3,637,924  | 32.7     | \$3,259,773  | 30.0     |
| Deductions from gross income .....         | †2,646,851   | 23.8     | \$2,565,730  | 23.6     |
| Net income .....                           | \$991,072    | 8.9      | \$694,042    | 6.4      |

\*No additions have been made to the depreciation reserve since Dec. 31, 1915.

†Interest on certificates of indebtedness of the Dry Dock, East Broadway & Battery Railroad has not been included in the account since Feb. 2, 1908.

The income account for the system during the current year shows, after the payment of all interest, taxes and depreciation, a balance of \$991,072, an increase of \$297,029 over the preceding year. The gross earnings of the company were the largest in its history and the net earnings also exceeded those of previous years and were abnormally large. The revenue from transportation increased \$272,048 or 2.6 per cent, and the operating expenses showed a net decrease so that the net operating revenue increased \$418,496 or 10.7 per cent.

The report states that the showing made is accounted for in part by the fact that since Jan. 1 no payments were made out of the net earnings into the depreciation fund, and also by reason of the fact that the condition of the labor market made it impossible to do a good deal of work which the company was anxious to do, and some of which it was under orders from various authorities to finish by fixed dates and yet was unable to find labor to do. It is stated that the company endeavored to find responsible contractors to take part of the work off its hands, but the answer from them has been that they could not take the contract at this time under any circumstances.

In respect to the adjustment bonds, \$248,000 have been purchased by the company under the following circumstances. At the time of the purchase of the Belt Line Railway Corporation an application was made to the Public Service Commission for permission to capitalize, among other things, a certain claim which that company had against the receivers of the old Metropolitan Street Railway. The claim was rejected by the commission as worthless. In the course of time, however, the claim realized in cash \$185,000 and that sum, of course, brought the cost of the Belt Line road down by the same amount. In order to save the large amount of interest it was devoted to the purchase of the adjustment bonds. Some other money, the report states, has been and will be devoted to the same purpose, and it may reasonably be expected that

within a comparatively short time the income from these bonds, together with such supplementary sums as the company can use for that purpose, will result in materially diminishing the principal of this mortgage.

In consequence of the 4 per cent bond issue of last October and the discontinuance of cash payments into the depreciation fund after Jan. 1, dividends were begun at the rate of 4 per cent on Jan. 1 and have been continued down to the present time. On Jan. 1 wages were increased by \$90,000 a year and since then the company has felt it desirable to make a further increase of about \$150,000. Nevertheless, President Whitridge thinks that the present rate of dividends can be maintained.

During the year the company's printing plant has been in active operation, and the results show that the actual saving is \$32,000 a year, considerably in excess over the amount originally estimated.

### HITCH IN NORTHERN ELECTRIC PLAN

Minority Opposition Leads Reorganization Committee to Allow Foreclosure of Three Underlying Issues—Hearing Before Commission

The recent hearing on the application of the reorganization committee of the Northern Electric Railway, Chico, Cal., before the California Railroad Commission occupied several days and involved the presentation of a large volume of evidence. Representatives of the overlying bondholders attacked the proposed reorganization plan and threatened resort to legal measures unless more favorable terms were offered. Later, because of the opposition of the small but insistent minority of the holders of notes and overlying bonds, the reorganization committee reluctantly decided to allow foreclosure proceedings to be taken by holders of three issues of the underlying bonds. First mortgage liens which are to be foreclosed forthwith comprise the entire bond issue of the Northern Electric Company, amounting to \$3,770,000; first mortgage issue of the Marysville & Colusa Branch Railway, amounting to \$750,000, and the first mortgage bond issue of the Sacramento & Woodland Railway, aggregating \$750,000.

When the commission opened the case it was apparent that there was a wide divergence of views as to the values involved. The reorganization plan called for the issuance of new securities totaling \$14,800,000, while the total reproduction cost reported by Richard Sachse, chief engineer for the commission, was \$10,392,316. The securities which were proposed to be issued by the new holding company were to comprise the following: (1) First mortgage 5 per cent bonds, \$500,000; (2) second mortgage 5 per cent bonds, interest payable for the first five years only if it is earned, but bearing an absolute interest rate of 5 per cent thereafter, \$5,300,000; (3) third mortgage income bonds, \$7,000,000; stock, \$2,000,000. The plan further provided that the bonds thus issued should be pledged as security for notes on the same basis as the bonds in lieu of which they were to be issued.

Under the direction of the reorganization committee, A. S. Kibbe, consulting engineer, presented to the commission a report showing how the Northern Electric Railway could increase its operating income nearly 50 per cent during the next four years by an aggressive campaign for new business. By reducing the ratio of operating expense from 76 to 70 per cent, the net income could be raised in the first year to \$164,000, during the second year to \$184,000, during the third year to \$221,000 and during the fourth year to \$272,000. This would involve, however, the expenditure of approximately \$500,000.

At the conclusion of the hearing Commissioner Edgerton stated that the commission would first pass upon the valuation of the properties and the earning power of the railway. Then it would be up to the security holders to get together by agreement, or resort to foreclosure proceedings. In the event of a foreclosure, he said it would appear that the underlying bondholders would undoubtedly get the best part of the properties, leaving the remnants for the overlying bondholders. This announcement of the commission's attitude was made prior to the decision of the reorganization committee to allow foreclosure. Earlier comment on the reorganization plan appeared in the ELECTRIC RAILWAY JOURNAL of July 10 and Oct. 23.

**UNITED RAILROADS CAPITALIZATION CUT IN HALF**  
**Further Details of Reorganization Plan That Is Urged for**  
**Quick Adoption in San Francisco**

The reorganization committee of the United Railroads of San Francisco, which as briefly noted in last week's issue has announced a plan involving the extinguishment of \$44,330,100 out of \$91,928,100 of capital liabilities, has asked for quick action on its proposals. The holders of the 4 per cent bonds of the company have been notified that bonds must be deposited immediately if the committee is to be placed in a position where it can undertake to prevent hostile foreclosure and receivership proceedings through the action of the holders of the underlying Market Street Cable Railway bonds and Ferries & Cliff House Railway bonds which mature this year. Pursuant to the provisions of the bondholders' deposit agreement the committee has extended the time for the deposit of bonds to Oct. 31, 1916.

Under the proposed plan, according to the full details now available, all of the physical properties, franchises, bonds and stock owned by the United Railroads, and all of the physical properties, franchises and bonds owned by the subsidiary San Francisco Electric Railways, are to be transferred to the Market Street Railway, which will thereupon become the operating company. All of the issued stock of this latter company is now owned by the United Railroads. The liabilities of the United Railroads which are thus to be readjusted and the bonds and stock of the Market Street Railway under the plan are as follows:

| Present                        | Future                         |
|--------------------------------|--------------------------------|
| Market Street Ry. bonds .....  | Market St. Ry. bonds .....     |
| \$7,098,000                    | \$7,098,000                    |
| United Railroads bonds .....   | Market St. Ry. bonds .....     |
| 23,854,000                     | 6,000,000                      |
|                                | First preferred stock .....    |
|                                | 11,000,000                     |
| Market St. Cable Ry. ....      | Market St. Ry. bonds .....     |
| 1,800,000                      | 3,000,000                      |
| The Omnibus Cable Co. ....     | 6 per cent debentures .....    |
| 2,000,000                      | 2,500,000                      |
| Ferries & Cliff House Ry. .... |                                |
| 400,000                        |                                |
| Sutter St. Ry. ....            |                                |
| 1,000,000                      |                                |
| 7 per cent notes... 1,925,000  | 2d preferred stock. 5,500,000  |
| 6 per cent notes... 740,000    | Common stock.... 12,500,000    |
| 5 per cent notes... 1,000,000  |                                |
| 1st preferred stock. 5,962,500 |                                |
| 2d preferred stock. 28,200,000 |                                |
| Common stock..... 17,948,600   |                                |
|                                | \$47,598,000                   |
|                                | Liabilities extinguished ..... |
|                                | 44,330,100                     |
| \$91,928,100                   | \$91,928,100                   |

From the above it will be noticed that all the underlying bonds of the Market Street Cable Railway, the Ferries & Cliff House Railway, the Omnibus Cable Company and the Sutter Street Railway, aggregating \$5,200,000, all of which bonds are now maturing or will mature during the next two years, are to be retired. The reorganization plan provides that the Eastern and other capitalists who hold the unsecured notes and stock of the United Railroads will furnish a fund for the payment of these bond issues, as and when they mature. The process by which this will be accomplished is the underwriting by the controlling California Railway & Power Company at 90 per cent of face value of a new issue of \$2,500,000 of serial debentures and also the underwriting at 90 of \$3,000,000 of Market Street Railway 5s to be taken in 1918 or before. The holders of the unsecured notes and stock of the United Railroads will receive new second preferred and new common stock of the Market Street Railway and the surrender of certain obligations as a consideration for the underwriting contract described above.

The committee believes that the foregoing plan is advantageous to the holders of the Market Street Railway 5 per cent bonds as it takes care of \$4,200,000 of bonds underlying that issue and adds to the security of those bonds the properties of the San Francisco & San Mateo Electric Railway, Sutter Street Railway, Sutro Railroad,

San Francisco Electric Railways and other property. The \$9,000,000 of Market Street Railway 5 per cent bonds to be issued includes all bonds exchanged for underlying bonds cancelled and to be cancelled.

The plan, the committee states, is as fair to the holders of the United Railroads 4 per cent bonds as the existing circumstances and conditions will permit. Besides taking care of the \$4,200,000 of underlying bonds mentioned, and the \$1,000,000 of Sutter Street bonds which underlie the United Railroads, it gives to these bondholders 25 per cent of the par value of the United Railroads bonds in Market Street Railway 5 per cent bonds and 46 per cent in the 6 per cent cumulative first preferred stock, thereby giving them new securities equal to 71 per cent of the face value of their present bonds, which are to-day selling on the market at 33 per cent of their face value. The new securities will entitle the bondholders to the same income they now receive, and will have to be paid in full before the stockholders below them receive anything in the way of principal.

In the opinion of the committee these bondholders can well afford to let the equities behind 71 per cent of the face value of their present bonds go to the present note-holders and stockholders in consideration of the latter financing the underlying bonds as proposed in the plan and surrendering all of their notes and also their claims to an interest in the property or to any equitable consideration which they might assert in the event of foreclosure proceedings on account of the fact that in 1906, at the time of the disaster, they paid in \$5,000,000 in cash for the rehabilitation of the property, and because in December, 1912, they loaned the company \$1,550,000 for the particular purpose of paying \$1,200,000 of Market Street Cable Railway 6 per cent bonds and \$350,000 of Park & Cliff House Railway bonds which matured Jan. 1, 1913, and on account of which there are \$1,550,000 of Market Street Railway 5 per cent bonds now unissued in the possession of the trustee and which it is proposed under the plan to transfer to the United Railroads bondholders.

Unless such a reorganization is brought about, the committee avers, a general foreclosure of all of the mortgages and a receivership seem inevitable. If a suit should be brought on the underlying bonds which mature this year, and a receiver should be appointed by the court, it would probably result in all of the other bond mortgages being foreclosed in the same suit, the property being sold as a whole and the proceeds distributed upon equitable principles among the various classes of bondholders and creditors, in accordance with the value of their various and respective security and interests. Owing to the number of bond mortgages now existing and the different portions of the properties upon which they are liens, it would be difficult to determine the respective values of the several classes of bonds and to what extent these various bonds might be used in payment of the properties at foreclosure sale, and a long and expensive litigation would or might ensue.

In view of these conditions, the committee concludes, it would seem that, even if foreclosure proceedings should be brought, it would become advisable, sooner or later, for all of the various bondholders, creditors and stockholders to come together and agree upon some plan of reorganization for the protection of their various interests and for the purpose of taking the controversy out of the courts and receivership, and it would therefore appear to be obvious that every effort should be exerted at the present time to come to an immediate agreement upon a plan of reorganization and save the properties from the results of such receivership and prolonged and expensive litigation.

**Boston (Mass.) Elevated Railway.**—The West End Street Railway has petitioned the Massachusetts Public Service Commission for the right to issue 12,000 shares of common stock, the proceeds of which will be used to reimburse the Boston Elevated Railway for improvements, etc. Of the 12,000 shares 4300 have been authorized by the stockholders and the remaining 7700 shares will be authorized at the annual meeting on Nov. 28.



**California Railway & Power Company, San Francisco, Cal.**—In issuing checks for a dividend of 1 per cent on the prior preference stock of the California Railway & Power Company, notice has been given of the reorganization committee acting in the case of the controlled United Railroads of San Francisco, the plan of which committee is described in another column. While the United Railroads hitherto has paid the interest regularly upon its notes held by the California company, it is said to be unlikely that it will be able to make remittance on this obligation during the period of its reorganization. In spite of this fact the directors of the California Railway & Power Company decided to pay the current dividend as they had the money on hand.

**Cities Service Company, New York, N. Y.**—The directors of the Cities Service Company have authorized the issuance of \$8,000,000 of preferred stock and \$118,800 of common stock, for the purchase of the capital stock of the Crew Levick Company, Ponca Refining Company, Cushing Refining Company and the Producers Refining Company. These properties will be subject to a bonded indebtedness of approximately \$5,500,000. The policy of City Service Company has been to pay no cash dividends on the common stock in excess of 6 per cent, but to reinvest all earnings in excess of this amount. To insure that this policy will be carried out it is proposed to amend the articles of incorporation.

**Empire United Railways, Inc., Syracuse, N. Y.**—The Bankers' Trust Company, New York, N. Y., has received \$15,000 from the estate of Clarence W. Seaman as a guarantor of \$381,900 of one year secured notes of the Empire United Railways, Inc., due on Feb. 16, 1916. The total of the obligations of the Seaman estate on this account is \$81,119 with accrued interest. It is announced that the Seaman estate will pay this amount, but that the executors have been handicapped in settling the estate. The Empire United Railways securities involved in the matter are successors to short-time notes of about \$1,000,000 in face value issued originally by the Rochester, Syracuse & Eastern Railroad. The issue became due on Feb. 16, 1915. Under a plan then agreed to holders of \$1,000 notes received about \$275 in cash, two \$100 bonds of the Empire United Railway and new short term notes issued by the consolidated company and guaranteed by signers of the original issues. Following the default on the new notes on Feb. 1, 1916, as to principal and interest the Bankers' Trust Company requested the guarantors of the notes to make good their obligation. All but four of the guarantors promptly made their payments and in March the Bankers' Trust Company distributed to holders \$633 on each note of the original par value of \$1,000.

**Oakland, Antioch & Eastern Railway, Oakland, Cal.**—The Oakland, Antioch & Eastern Railway has just completed its third year of operation as an interurban electric system. While a detailed comparison has not been made, it is stated that this is the only electric system in the State showing an increase in freight and passenger revenue for the fiscal year ended July 1, 1916. This condition is largely due, it is pointed out, to the fact that the road has had very slight jitney competition. The following comparative table for years ended Aug. 31 indicates the ratio of increase in business: Passenger revenue—1914, \$374,267; 1915, \$457,523; 1916, \$497,707; freight revenue—1914, \$59,005; 1915, \$61,447; 1916, \$96,528; passengers carried—1914, \$572,773; 1915, \$650,047; 1916, \$750,869.

**St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.**—The St. Joseph Railway, Light, Heat & Power Company has executed a first and refunding mortgage for \$15,000,000 to the Bankers' Trust Company, New York, N. Y., and the Mississippi Valley Trust Company, St. Louis, Mo., as trustees, given to secure 5 per cent thirty-year gold bonds, the proceeds of which are to be used to retire \$5,000,000 of its first mortgage bonds and \$326,000 of first mortgage bonds of the St. Joseph & Savannah Interurban Railway now outstanding and for other corporate purposes.

**Sapulpa & Interurban Railway, Sapulpa, Okla.**—The final transfer of the property of the Sapulpa & Interurban Railway from the hands of the receiver to Charles Williams, St. Louis, who recently purchased it at receiver's sale, has been made with the approval of the

court and the filing of the record. No changes are contemplated in the management. Mr. Williams is understood to be acting for the Midland Valley Railroad, an operating steam railroad.

**DIVIDENDS DECLARED**

Athens Railway & Electric Company, Athens, Ga., quarterly, 1¼ per cent, preferred.

Boston (Mass.) Suburban Electric Companies, quarterly, 50 cents, preferred.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1½ per cent, preferred; quarterly, 1½ per cent, common.

Citizens' Traction Company, Oil City, Pa., quarterly, 1½ per cent, preferred.

Detroit (Mich.) United Railway, quarterly, 1¼ per cent.

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

Philadelphia & Western Railway, Upper Darby, Pa., quarterly, 1¼ per cent, preferred.

Scioto Valley Traction Company, Columbus, Ohio, quarterly, 1¼ per cent, first preferred and preferred.

Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, preferred; monthly one-half of 1 per cent, common.

**ELECTRIC RAILWAY MONTHLY EARNINGS**

| ATLANTIC SHORE RAILWAY, SANFORD, ME.                    |     |                   |                    |                  |               |            |
|---------------------------------------------------------|-----|-------------------|--------------------|------------------|---------------|------------|
| Period                                                  |     | Operating Revenue | Operating Expenses | Operating Income | Fixed Charges | Net Income |
| 1m., Aug.                                               | '16 | \$53,860          | *\$30,000          | \$23,860         | .....         | .....      |
| 1 "                                                     | '15 | 51,882            | *27,561            | 24,321           | .....         | .....      |
| AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.          |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$198,214         | *\$125,332         | \$72,882         | \$35,933      | \$36,949   |
| 1 "                                                     | '15 | 189,975           | *120,667           | 69,308           | 36,517        | 32,791     |
| 2 "                                                     | '16 | 407,244           | *254,767           | 152,477          | 72,051        | 80,426     |
| 2 "                                                     | '15 | 377,463           | *241,392           | 136,071          | 73,047        | 63,024     |
| CONNECTICUT COMPANY, NEW HAVEN, CONN.                   |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$910,429         | *\$689,838         | \$220,591        | \$98,634      | \$144,667  |
| 1 "                                                     | '15 | 796,220           | *506,578           | 289,642          | 98,145        | 1214,122   |
| 2 "                                                     | '16 | 1,842,935         | *1,277,293         | 565,642          | 197,268       | 1414,928   |
| 2 "                                                     | '15 | 1,602,703         | *981,569           | 621,134          | 196,410       | 1470,531   |
| GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.     |     |                   |                    |                  |               |            |
| 1m., July.                                              | '16 | \$172,935         | *\$100,904         | \$72,031         | \$36,280      | \$35,751   |
| 1 "                                                     | '15 | 174,092           | *107,635           | 66,457           | 35,917        | 30,540     |
| 12 "                                                    | '16 | 1,902,376         | *1,200,898         | 701,478          | 436,822       | 264,656    |
| 12 "                                                    | '15 | 2,132,910         | *1,236,432         | 896,508          | 433,219       | 463,289    |
| HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.            |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$445,555         | *\$206,622         | \$238,933        | \$215,051     | 23,882     |
| 1 "                                                     | '15 | 427,195           | *191,113           | 236,082          | 212,032       | 24,050     |
| 2 "                                                     | '16 | 894,650           | *410,393           | 484,257          | 429,349       | 54,908     |
| 2 "                                                     | '15 | 855,109           | *381,044           | 474,065          | 423,239       | 50,826     |
| NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y. |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$46,027          | *\$45,074          | \$953            | \$8,019       | †\$5,965   |
| 1 "                                                     | '15 | 46,621            | *41,327            | †706             | \$5,842       | †5,036     |
| 2 "                                                     | '16 | 96,072            | *89,579            | 6,493            | \$14,034      | †15,374    |
| 2 "                                                     | '15 | 83,232            | *84,614            | †1,382           | \$14,187      | †11,713    |
| RHODE ISLAND COMPANY, PROVIDENCE, R. I.                 |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$587,474         | *\$369,299         | \$218,175        | \$120,714     | †\$99,067  |
| 1 "                                                     | '15 | 511,492           | *349,743           | 161,749          | 120,284       | †42,852    |
| 2 "                                                     | '16 | 1,156,749         | *740,800           | 415,949          | 241,403       | †177,667   |
| 2 "                                                     | '15 | 983,640           | *669,158           | 314,482          | 240,568       | †76,600    |
| TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.     |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$849,966         | \$525,187          | \$324,779        | \$144,734     | \$180,045  |
| 1 "                                                     | '15 | 798,901           | 496,687            | 302,214          | 145,697       | 156,517    |
| 8 "                                                     | '16 | 6,740,241         | 4,187,967          | 2,552,274        | 1,143,167     | 1,409,107  |
| 8 "                                                     | '15 | 6,196,934         | 4,028,822          | 2,168,112        | 1,131,830     | 1,036,282  |
| WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.        |     |                   |                    |                  |               |            |
| 1m., Aug.                                               | '16 | \$21,076          | *\$21,872          | †\$796           | \$1,863       | †\$2,630   |
| 1 "                                                     | '15 | 24,718            | *22,182            | 2,536            | 1,598         | †970       |
| 2 "                                                     | '16 | 44,201            | *44,271            | †70              | 3,678         | †13,694    |
| 2 "                                                     | '15 | 50,734            | *44,900            | 5,834            | 3,188         | †2,708     |

\*Includes taxes †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad not credited to income of that company.

## Traffic and Transportation

### JOPLIN ABANDONS TRANSFER MOVE

Companies' Explanation of Their Inability to Meet Proposed Demand Accepted by the City

A move to have a universal transfer system established on the railways in Joplin, Mo., was abandoned on Sept. 20, by J. F. Lee, commissioner of public property and public utilities, and Mayor McIndoe after a conference with W. A. Satterlee of the Joplin & Pittsburgh Railway and D. C. Morris, representing the Southwest Missouri Railroad. E. F. Cameron, city attorney, also attended the conference. Mayor McIndoe and Mr. Lee said they would not take the matter before the Public Service Commission of Missouri because they had faith in the arguments presented by the railroads against the plan.

The Southwest Missouri Railroad's case was explained in a letter received by the Mayor from A. H. Rogers, president of the company, as follows:

"You have requested that the Joplin & Pittsburgh and the Southwest Missouri Railroad companies inaugurate a system of inter-company transfers in Joplin, so that a passenger can board a car on either line and by transfer ticket be carried from any point within the city on either line to any point within the city on the other line.

"The two street railways are entirely separate and distinct organizations and each is giving universal transfers within the city to its own passengers, and I cannot see any good or valid reason—or justice—in the request that their transfer privileges be enlarged so as to include inter-company business. The result would be that the fare received by either company from each passenger transferred from one line to the other would be only 2½ cents. This means a 50 per cent reduction in said fares and would entail a loss on each passenger so transferred. The street railways of the country are all suffering from largely increased costs of operation without any corresponding increase of income, and the situation in Joplin is the same as elsewhere. The amount received here per passenger is the same as it was twenty years ago, and the cost of transporting each passenger has increased significantly.

"At present the Southwest Missouri Railroad is under contract to do a large amount of street paving in Joplin and other cities along its lines, which will entail an expenditure of more than \$100,000. This money must all be paid out of earnings. No bonds can be issued for this purpose, as no increase of business or revenue will result from these street improvements. In fact, a loss of business to jitney competition may be anticipated.

"The loss of revenue that would result from inter-company transfers is something that neither company is in a position to bear, and is something the like of which would hardly be requested from any other line of business in your city.

"Therefore, I desire to advise you that I cannot, consistently with my duties as I see them, voluntarily comply with your request, and I trust you may regard your two street railways as good fellow citizens and carefully consider the hardships under which they are already laboring, and not add anything to their existing burdens. In the day of \$100 jack their volume of business temporarily was largely increased, but now it is getting down to its ordinary basis and the companies are compelled to practice every possible economy consistent with the necessary costs of operation, which seems still to be mounting higher and higher. They are not asking any increase in their rates of fares, which is now the prevailing custom with railroads and other public utilities, but do ask that the present low rates be not revised downward.

"Street railway fare in Joplin is one of the few things that has remained stationary in these days of almost universal advanced prices and costs of living."

Mr. Satterlee told the conferees that it costs his company more than 4 cents for each passenger hauled in the city.

### ROCHESTER COMPANY COMPLYING WITH DECISION

Report of Commission Inspector Shows That New York State Railways are Meeting Requirements of Jitney Decision

The Public Service Commission for the Second District of New York has approved a report of Charles R. Barnes, electric railway inspector, which shows that the Rochester lines of the New York State Railways have complied or are complying with all but two of the minor recommendations for improvements imposed on the company by the commission, following denial of permission to operate independent jitney buses in competition with the electric railway in Rochester.

The two minor recommendations which the report shows the company is disinclined to follow are the connection of the Lake Avenue and Dewey Avenue lines through Ridge Road and new trackage in Mount Hope Avenue. The commission holds these recommendations in abeyance pending the study of the transportation situation in Rochester now being made by an engineer in the employ of the Rochester Chamber of Commerce.

The other recommendations of the commission will provide a seat for every passenger in Rochester throughout the day, through additions of equipment, re-routing cars, installation of additional facilities and the elimination of cases of delay. These involve large amounts of new construction and rearrangement, and it is estimated that the total cost of the improvements now under way will be more than \$1,000,000.

An interesting feature of the development is the entrance of the railway into the jitney field itself. As the north side cross-town line recommended by Mr. Barnes cannot be built until the city builds a new bridge over the Genesee River, the company proposes to cover this route by motor buses running on a fifteen-minute headway during the day with increased rush-hour service, and affording transfer facilities at a slight cost between the seven north and south trolley lines which the bus route will cross. The fare on the buses will be 5 cents, without transfer privilege, but transfers will be issued from one north and south railway line to another, good on the second line after crossing town via the bus. The buses will run a total distance of 2½ miles.

The fifty new cars which the company will operate were ordered last April for delivery early this fall, but the condition of the steel market at present indicates that the cars will not be delivered before next month. These cars are of the latest design, light weight, four motor, single and prepayment type, with front and rear entrances and center exists and will seat fifty-two passengers each.

The decision of the commission in the Rochester jitney case, far-reaching in its importance, was reviewed at length in the ELECTRIC RAILWAY JOURNAL of May 20, page 957.

### HEARING ON BERKSHIRE THROUGH CONNECTION

The Public Service Commission of Massachusetts held a hearing at Boston on Oct. 3 upon the petition of residents of Westfield, Huntington and other towns of the Berkshire district that the Berkshire Street Railway be required to place its Lee-Huntington line in operation. Clinton Q. Richmond, general manager of the company, stated that the company was greatly disappointed at not being able to obtain a location several years ago from North Blandford to Westfield in place of the existing route from North Blandford to Huntington. Consequently the company was obliged to build its line over an unsatisfactory 5-mile route, whereas the preferred route was much easier. Until the company felt assured that it could operate safely over these long grades it could not undertake to render service over the Blandford-Huntington section, especially in view of the severe climatic conditions. The Lee-Huntington line represented an investment of about \$3,000,000. The company had undertaken to operate sections of the line running eastward from Lee. Mr. Richmond said that the construction difficulties were perhaps not fully appreciated by the petitioners. The company did not believe that it would be feasible to haul loaded freight cars over the Blandford-Huntington section of the line. Even for

a passenger service and light express traffic it would be necessary to install a substation to feed the middle portion of the mountainous route. About 13 miles of line are under operation at present, while 10 miles are not in service. If the commission ordered service to be established between Lee and Huntington, the company would be obliged to inaugurate it as soon as safe operating conditions could be assured. About \$19,000 would have to be expended before the line could be opened for operation from terminal to terminal.

Mr. Richmond said that the financial condition of the company had an important bearing upon the opening of any further lines. The investment of the New Haven company in the Berkshire system is \$11,298,820, and the public owns underlying bonds amounting to \$1,500,000. The gross earnings of the system for the year ended June 30, 1915, were \$952,868; operating expenses were \$802,759; net earnings, \$150,109; taxes, \$61,679; balance, \$88,430; interest on bonds in the hands of the public, \$69,000; balance for bonds owned by the New Haven, \$19,430. During the last fiscal year the New Haven company not only received no adequate return for the bonds and notes held by it, but, in addition, had to advance \$216,272 to make needed additions and betterments to the property to keep it in reasonable condition. For the ten months ended April 30, 1916, the results were only slightly better, the property not earning enough to pay the interest on the bonds owned by the public and by the New Haven, amounting to \$2,346,000. The commission took the case under advisement.

#### TOWNS AND CITIES HELD TO BE SINGLE-FARE PASSENGER UNITS

That towns and cities in Indiana through which interurban lines are operated are passenger units and that no more than 5 cents fare can be charged within the limit of the unit is held by the Public Service Commission of Indiana, which has decided a case at Elkhart, through a letter written by Charles A. Edwards, a member of the commission, to the Rev. F. J. Jansen of Elkhart.

Mr. Edwards stated that the Elkhart situation was the only case of its kind that he knew of in Indiana. He said that in all towns and cities of the State a fare of 5 cents is charged for all travel within the limits of the town or city. Whether the passenger boards the car some distance from the central station of an interurban company in any city or town, or whether he boards it at the station, makes no difference in his fare from that city to another city and makes no difference in the 5-cent fare charged between points in the same city. If the passenger leaves the car beyond the central station of an interurban company, but still within the city or town limits to which he has paid his fare, Mr. Edwards said, no additional charge can be made.

The Rev. Mr. Jansen had complained to the commission that the interurban car on which he was accustomed to travel to the rectory of the church stopped at the Elkhart interurban station, and that the conductor insisted on collecting an additional fare from him if he rode the few blocks to the rectory, beyond the central station. The Chicago, South Bend & Northern Indiana Traction Company, which operates the interurban line in question, showed that it had filed its tariffs with the commission on the basis of the "penny zone," and had based its rates on 1 mile zones within the city limits of Elkhart at the rate of 2 cents per mile.

In his letter to the company requesting that they rearrange their tariff Mr. Edwards stated that the city through which the interurban operated should be taken as a unit, and no additional charge should be made for carrying the passenger beyond the central station, as long as his stop was within the corporation limits. Mr. Edwards said that he had submitted the question to the commission and was upheld in his decision. Under this ruling, a passenger taking a car at Goshen, for example, and riding to the central station at Elkhart, would, if he so desired, be able to continue his ride to a further point in the city of Elkhart on a through interurban car without payment of any additional fare.

**Railway to Operate Gasoline Launches.**—The Evansville, Suburban & Newburg Traction Company, running out of Evansville, Ind., will put two gasoline launches into service on the Ohio River, to ply between Newburg, Ind., and Owensboro, Ky. This will give the people of the Owensboro direct connection with Evansville. A through rate will be quoted.

**Twenty-five Year Jitney Grant Discussed.**—At a recent informal meeting of the City Council of Portland, Ore., the proposition of issuing a franchise for a period of twenty-five years to a jitney company was discussed, and was referred to Commissioners Daly and Dieck. F. T. Griffith, president of the Portland Railway, Light & Power Company, was present at the meeting and protested against the granting of the franchise unless regulations were inserted similar to those imposed on his company.

**Buffalo Line Handles Peaches.**—The International Railway, Buffalo, N. Y., is operating four express fruit trains each way daily between Buffalo and Olcott Beach. The line bisects the famous Niagara County fruit country where hundreds of thousands of bushels of peaches are marketed annually. Large electric locomotives are used to haul the trains over the interurban lines and in most cases the International box cars are used. Fruit for shipment long distances is packed in railway refrigerator cars and turned over to the trunk line railroads at Lockport and Buffalo.

**Dallas Jitneys Decrease in Number.**—There were 331 jitneys in operation on the streets of Dallas, Tex., on Sept. 26, according to the report of City Automobile Inspector Birthright to Police Commissioner Winfrey. This is a decline of twenty-four jitneys for one week, as the report for the preceding week showed 355 jitneys in operation. There has been a marked decrease in the number of jitneys recently, the number dropping from more than 500 to 331 in a few weeks. Many licenses are expiring now and comparatively few of these are seeking a renewal of their grants to operate.

**Plea Entered to Abandon Line.**—Ansel M. Easton, who owns and operates the Burlingame (Cal.) Electric Railway, has filed with the Railroad Commission of California an application for authority to abandon the railway, claiming it has never paid expenses, and during the last year has lost \$3793.58. Mr. Easton obtained a franchise for the railway in 1911, and built a single-track line running from Broadway to Hillside Drive and Vancouver Avenue. The cars were operated by storage battery and the fare has been 5 cents. Mr. Easton says that he will pave the right-of-way upon removal of the tracks, and he wants the commission to declare his rights to operate the line forfeited.

**Failure to Live Up to Traffic Rules Alleged.**—The Public Service Commission of Maryland has adopted an order requiring the United Railways & Electric Company, Baltimore, Maryland, to meet the service requirements promulgated by the commission recently. The commission states that on May 29, it adopted rules for the regulation of traffic, and for "the comfort, convenience and safety of the public," especially with reference to the carrying capacity of cars; and that from checks made by the commission's transportation expert and from numerous complaints from citizens, it appears that the rules "are not being observed as they should be, and as the public and the commission are entitled to expect and demand."

**Board of Trade Protests Jitney Competition.**—The Hollywood Board of Trade has registered with the City Council and the Public Utilities Board of Los Angeles, Cal., a resolution protesting against the jitney bus competition existing under present regulations. The Hollywood organization asks that jitney permits be limited to streets in Hollywood that are not now served by the Pacific Electric Railway and to streets that will open up new service territory. The resolution calls attention to the part the Pacific Electric Railway has taken in building up the community, and also to the large investment the railway has made, particularly in street paving and in payment of taxes. The Council has referred the resolution to the Public Utilities Board.

## Personal Mention

**J. F. Henning** has resigned as superintendent of materials and supplies of the Chicago (Ill.) Surface Lines to become assistant general manager of the Vesta Accumulator Company, Chicago.

**C. B. Hammond**, chief clerk of the Elmira, Corning & Waverly Railway and the Corning & Painted Post Street Railway, Elmira, N. Y., has been appointed general agent of both companies. Mr. Hammond has been with the companies since October, 1909.

**S. B. Irelan**, manager of the City Light & Traction Company, Sedalia, Mo., was presented with a handsome gold watch by the employees of the Bartlesville, (Okla.) Interurban Railway when he returned to Bartlesville recently for a visit. Mr. Irelan was formerly manager of the property at Bartlesville.

**W. L. Wuster**, chief clerk in the payroll and distribution department of the Chicago (Ill.) Surface Lines, has been appointed superintendent of materials and supplies of the company to succeed J. F. Henning, resigned. Mr. Wuster was born in Chicago in 1888 and after completing his education in the public schools took a course in electrical engineering at Armour Institute of Technology, Chicago. In 1907 he accepted a position with the Chicago City Railway as street timekeeper in the track department. In 1909 he was made time distribution clerk in the track department, and in 1912 he was appointed chief clerk of the payroll and distribution division of the Chicago City Railway.

**John A. Clay**, who has been elected president of the Colorado Electric Light, Power & Railway Association, is the general manager of the Western Colorado Power Company, with headquarters at Montrose, Col. Mr. Clay was graduated sixteen years ago from the engineering department of the University of California. His first position in the central station field was with the Independent Light & Power Company, San Francisco. Later he entered the employ of the Pacific Mail Steamship Company in its San Francisco-China service. Shortly thereafter, however, he took up construction work ashore for the General Electric Company in the Northwest. Entering central station work again he was employed by the Tacoma Railway & Power Company and the Washington Water Power Company. Then for a period he was connected with the Hecla Mining Company in the Coeur d'Alene district. Since 1906 Mr. Clay has been with the Western Colorado Power Company of Montrose, remaining through various reorganizations.

**A. L. Langdon** has retired as traffic manager and general freight agent of the Long Island Railroad under the pension rules of the company, after nearly fifty-three years of continuous service with the Cumberland Valley, Pennsylvania and Long Island Railroads. With the retirement of Mr. Langdon the position of traffic manager will be discontinued, but the duties of that office will be performed by the general freight agent and the general passenger agent, who will report directly to the president. Mr. Langdon was born seventy years ago at Sugar Grove, Pa. He was educated at the Randolph Academy, from which he was graduated in June, 1863. He entered the service of the Pennsylvania Railroad in November, 1863, as a clerk at Corry, Pa. On June 15, 1903, he was transferred to the Long Island Railroad as general freight agent, and on Feb. 1, 1905, he was promoted to traffic manager of the Long Island Railroad. Donald Wilson, formerly special agent in Mr. Langdon's office, will be advanced to the position of general freight agent of the Long Island Railroad.

**M. J. Feron**, in addition to his duties as general superintendent of transportation of the Chicago (Ill.) Elevated Railways, has been appointed superintendent of transportation of the Chicago, North Shore & Milwaukee Electric Railway. J. W. Simons, the present superintendent of that road, will report to Mr. Feron. Mr. Feron has been connected with the elevated railway systems of Chicago for about twenty-

two years. Previous to that he was for several years with the Chicago & Northwestern Railway as yard master. Mr. Feron entered the employ of the Metropolitan West Side Elevated Railway of Chicago as switchman, and since has served as dispatcher, train master and superintendent of that road. With the consolidation of the operating staffs of all the elevated railways in Chicago in the fall of 1911 Mr. Feron was appointed general superintendent of transportation. His duties are now extended to cover the 186 miles of high-speed, double-track suburban and interurban road connecting Chicago and Milwaukee.

**B. J. Fallon**, engineer of maintenance of way of the Chicago (Ill.) Elevated Railways, has been appointed chief engineer of the Chicago, North Shore & Milwaukee Electric Railway. He now has jurisdiction over the way and structures departments of all of the Chicago elevated lines, and will have charge of all of the engineering work on the double track interurban line which connects Chicago and Milwaukee. J. S. Hyatt, engineer of maintenance of way of the Chicago, North Shore & Milwaukee Electric Railway, will remain in charge of the way department, reporting to Mr. Fallon. Mr. Fallon graduated from De LaSalle Institute, Chicago, in 1890, and began work with the Chicago, Burlington & Quincy Railroad, in whose service he spent eight and one-half years, during which time he served as rodman, assistant maintenance engineer, locating and construction engineer, division engineer, Chicago division; assistant engineer and superintendent of track elevation at Chicago. In 1907 Mr. Fallon was appointed engineer of maintenance of way of the Metropolitan West Side Elevated Railway in Chicago, and in March, 1910, he was made assistant general manager of that road. With the consolidation of the operating staffs of all of the elevated railways in Chicago in the fall of 1911, Mr. Fallon was appointed engineer of maintenance of way of the Chicago Elevated Railways.

**Thomas Penney**, former president and for several years past general counsel of the International Railway, Buffalo, N. Y., has been elected a vice-president in addition to E. J. Dickson. This is a newly created position. Mr. Penney resigned as president of the International Railway and the International Traction Company in January, 1913, but continued as a director of the companies. He is a member of the firm of Norton, Penney, Spring & Moore, attorneys. Mr. Penney was born in London, England, and came to this country when a boy. He prepared for college at Williston Seminary, East Hampton, Mass., and after completing the academic course at Yale he took a law course of two years, graduating with the degree of Bachelor of Arts and Bachelor of Law and was admitted to the bar of Connecticut. In 1889 he began the practice of law in Buffalo and in 1895 became first assistant to the district attorney, which position he occupied for four years. A vacancy then occurred in the office of district attorney and Mr. Penney was appointed to fill that office. The following year he was elected to that office for a term of three years. He declined a renomination, and resigned, having become a member of the firm of Norton, Penney & Sears. Mr. Penney served as president of the local railway in Buffalo from 1908 to 1913.

## OBITUARY

**Leigh Stanley Bache** died on Sept. 26. He was first vice-president and general manager of the Bound Brook Oilless Bearing Company, Bound Brook, N. J.

**George E. Hill**, a leader of the Fairfield County Bar, formerly president of the State Bar Association, and many times honored by selection to various offices, died at Bridgeport, Conn., on Sept. 30, in his fifty-second year. He had served for two years as a trustee of the Connecticut Company, which took over the electric railway holdings of the New York, New Haven & Hartford Railroad.

**James Lumsden**, treasurer of the Lumsden & Van Stone Company, steam piping engineers and contractors, Boston, Mass., died suddenly near Bingham, Me., on Sept. 25. Mr. Lumsden had been in poor health for two years. Besides his connection with the Lumsden & Van Stone Company, Mr. Lumsden was a director of the Federal Trust Company and was also prominent in Masonic affairs. He was fifty-two years of age.

## Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (\*) indicates a project not previously reported.

### RECENT INCORPORATIONS

\***Carolina Southern Railway, Orangeburg, S. C.**—Incorporated to construct a standard gage railroad from Orangeburg to Estill, S. C., about 60 miles. Electric or steam power can be used. Capital stock, \$30,000; maximum \$1,000,000. Incorporators: J. Leroy Dukes, Orangeburg; E. N. Mittle, Bowman, and W. C. Martin, Branchville.

### FRANCHISES

**Henderson, Ky.**—The City Council of Henderson passed the new street car franchise on its first reading. Several changes were made in the ordinance as to fares, routes and time to make required repairs, in the event that the Henderson Traction Company becomes the purchaser. The new franchise is to continue for twenty years.

**Moncton, N. B.**—It is reported that this company has asked the City Council for a franchise to construct an extension of its line from the present terminus on John Street to the corner of Wilbur and Union Streets.

**Portland, Ore.**—A franchise granting the right to operate street cars over the interstate bridge across the Columbia River between Vancouver, Wash., and Portland, Ore., has been granted to the Portland Railway, Light & Power Company by the Pacific Highway Bridge Commission. By the conditions of the franchise, the Company is to maintain a thirty-minute schedule from 6 a. m. until 11.30 p. m. and payment to Multnomah County, Ore., and Clarke County, Wash., will be one-half of the profits of the company over operating expenses. The company will be obliged to install wires, poles and conduits for the operation of cars, and to maintain the tracks on the bridge, without expense to the counties.

### TRACK AND ROADWAY

**Mobile, Volanta & Pensacola Railway, Mobile, Ala.**—This company, which was formerly the Mobile & Baldwin County Railroad, proposes to construct a 40-mile extension east to Pensacola, Fla. It is stated that the company will issue \$100,000 bonds to secure funds for carrying out the work.

**Pacific Electric Railway, Los Angeles, Cal.**—This company will reconstruct its tracks on Santa Monica Boulevard, Sawtelle. New ties and the latest type of heavy T-rails will be laid and the pavement will be of asphalt with concrete base. Cobblestones will be laid against the rails.

**Central Florida Interurban Railway, St. Cloud, Fla.**—Right-of-way has been secured for most of the route of this company's proposed line from St. Cloud to the East Coast and to points in central Florida, and it was expected that surveys would be begun on Oct. 1. William Hall, St. Cloud, secretary. [Sept. 23, '16.]

**Boise (Idaho) Railroad.**—Work will soon be begun by this company on the reconstruction of its track on Warm Springs Avenue. A new concrete base will be laid under the track and 60-lb. rails will be used.

**Pocatello Traction & Interurban Railway, Pocatello, Idaho.**—According to reports, the Pocatello Traction & Interurban Company is considering the extension of its lines to the upper Snake River Valley, and on to Rexburg. The Rexburg Commercial Club is agitating the proposition. Clark Gibson, Pocatello, secretary of the company, has been delegated to find out the sentiment in the communities through which the proposed line will pass.

**Lee County Central Electric Railway, Amboy, Ill.**—This company's line south of Ashton, extending to Amboy, has ceased to be operated as an electric road and the wire has been sold. The road is now being operated by steam. It is stated that the line will be extended from Amboy to Reynolds Church.

**Illinois Traction System, Peoria, Ill.**—This company has announced that it will make a number of improvements in its track and roadway in and near Catlin.

**Union Traction Company of Indiana, Anderson, Ind.**—The Public Service Commission of Indiana has granted the Union Traction Company an extension of time until Nov. 1, 1917, to complete the installation of a block signal system.

**Rockford & Interurban Traction Company, Rockford, Ind.**—This company is relocating its tracks in the center of the street along the east end of Taylor's Park.

**Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa.**—This company is constructing an extension of its line from Gypsum to Brushy, about 7½ miles. Contracts for the grading have been let to Donald Jeffery, Delmar, Iowa, and Duggan & Naylor, Omaha, Neb. Three bridges, two concrete box culverts and one 50-ft. deck girder span on concrete abutments, will be built by A. H. Neumann & Company, Des Moines. R. L. Cooper, chief engineer, has active supervision of the work.

**Winnipeg (Man.) Electric Railway.**—The Manitoba Public Utilities Commission has refused to grant a hearing on the application of the City Council to compel the Winnipeg Electric Railway to construct a temporary line on Sargent Avenue from Arlington Street to Wall Street.

**Winnipeg, Selkirk & Lake Winnipeg Railway, Winnipeg, Man.**—This company is double-tracking its line from the city limits of Winnipeg to Kildonan Park, about 1½ miles.

**Cumberland & Westernport Electric Railway, Cumberland, Md.**—It is reported that this company will reconstruct its line between Moscow and Barton, having obtained right-of-way which will shorten the distance between the two points.

**Bay State Street Railway, Boston, Mass.**—The Public Service Commission has approved the petition of the Bay State Street Railway for permission to relocate its tracks from Wyman Street to North Federal Street, Lynn.

**Norfolk & Bristol Street Railway, Foxboro, Mass.**—This company reports that it has ordered special work for a double-track connection with the Bay State Street Railway at Norwood, Mass., to be installed during this month.

**Worcester (Mass.) Consolidated Street Railway.**—The Public Service Commission has granted the petition of the Worcester Consolidated Street Railway to relocate its tracks on Water Street between West and Main Streets.

**Kansas City (Mo.) Railways.**—This company will construct an extension of its Broadway line to Twenty-fourth Street and to the Union Station as soon as permission is received by the Kansas City Terminal Company to use the Broadway viaduct.

**Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.**—It is reported that work will be begun next spring by the Omaha, Lincoln & Beatrice Railway on the construction of an extension from Omaha to Lincoln.

**New York Municipal Railway, Brooklyn, N. Y.**—Bids will be received by the New York Municipal Railway until Oct. 16, for the installation of tunnel and station lighting equipment, etc., for the Broadway subway in Manhattan. Plans and further information may be obtained upon application to W. S. Menden, chief engineer, 85 Clinton Street, Brooklyn.

**Interborough Rapid Transit Company, New York, N. Y.**—Bids have been received by the Public Service Commission for the First District of New York for the construction of a railroad yard for the storage of subway cars in connection with the White Plains Road extension of the Interborough Rapid Transit Company. The yard is officially designated as the 239th Street yard, and will cover an area of several city blocks. Another yard is now being built at 180th Street and Bronx Park on the White Plains Road line. The 239th Street yard will make provision for 580 subway cars on 37 tracks, and an adjoining yard to be built on the same plot by the company will have a capacity for about 350 elevated cars. In order to prevent grade crossings at the entrance to the yard, the contract provides for the reconstruction of a portion of the White Plains Road structure south of the 241st Street terminal station. The Thomas J. Buckley Construction Company, New York City, was the low bidder for the construction of the yard at \$372,392.

**Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.**—A contract has been awarded by the Cleveland, Southwestern & Columbus Railway to L. F. Gotte, Berea, at \$40,000 for grading a new branch line around Berea.

**Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.**—The Ohio Valley Traction Company, a subsidiary of the Portsmouth Street Railroad & Light Company, is constructing an extension to Ironton and will enter the city over the Sixth Street route.

**Tulsa & Oklahoma City Rapid Transit Company, Tulsa, Okla.**—S. A. Horton, attorney, 415 to 418 Baltimore Building, Oklahoma City, Okla., who is interested in the promotion of the Tulsa & Oklahoma City Rapid Transit Company, announces that construction work will be begun Oct. 20. It is said that right-of-way from Tulsa to Oklahoma City has been secured and all matters relative to bonuses arranged. The line will be about 170 miles long. [Apr. 17, '15.]

**Guelph (Ont.) Radial Railway.**—This company will reconstruct about 3000 ft. of track on Ogilvie Street, Guelph, next spring.

**Portland & Oregon City Street Railway, Portland, Ore.**—Work on the Portland & Oregon City Street Railway from Powell and East Twenty-second Streets to East Third and East Clay Streets in Portland is progressing very rapidly, and it is thought the Portland end of the railway will be completed the latter part of this month. Heavy steel rails are being laid.

**Philadelphia, Pa.**—Sealed proposals will be received by William S. Twining, director Department of City Transit, 754 Bourse Building, Philadelphia, until Nov. 2 for the construction of a section of the Broad Street subway, comprising a portion of the station under City Hall and the Market Street subway and work appurtenant thereto, known as Contract 102. This section will be about 300 ft. long and 106 ft. wide, embracing four tracks with two station platforms, and will include the underpinning of the west side of City Hall and also the Market Street subway.

**Pittsburgh (Pa.) Railways.**—The petition of the Monongahela Street Railway and the Pittsburgh Railways to the Public Service Commission for permission to tear up the double tracks on Eighth Street between Talbot and Braddock Avenues has been granted by the commission with modification. In the petition it is requested that no municipality be permitted to grant a corporation right to lay tracks on the street. The commission holds that the rights of future traffic cannot be jeopardized and that any time after ten years the company may be ordered to restore the tracks.

**Three Rivers (Que.) Traction Company.**—This company is completing the construction of an extension of its line from Three Rivers to Cap de la Madeleine, and it is expected that operation will be begun this month.

**Saskatoon (Sask.) Municipal Railway.**—About 1200 ft. of double track has been laid by the Saskatoon Municipal Railway on the new Twenty-fifth Street bridge and it is expected that the bridge will be opened for traffic by the end of October.

**Galveston (Tex.) Electric Company.**—This company is laying new rails on Winnie Street from Thirty-third to Forty-first Streets, also on Forty-first Street from Winnie Street to Broadway.

**Paris (Tex.) Transit Company.**—The City Council and the Paris Transit Company have reached an agreement whereby ornamental iron poles will be used for supports for the company's trolley wires on the public square, and the city will attach brackets and use the same poles for street lighting purposes.

**Blue Ridge Light & Power Company, Staunton, Va.**—This company has decided to make improvements and extensions in its street railway system and to add new cars and carhouse facilities and has employed W. E. Moore & Company, engineers, Pittsburgh, Pa., to supervise the construction. It is expected that these improvements will be completed by the early spring of 1917.

**Monongahela Valley Traction Company, Fairmont, W. Va.**—A report from the Monongahela Valley Traction Company states that it expects to place contracts within the next three weeks for the construction of a ½-mile extension and

paving in Stealy Heights addition to Clarksburg and a ½-mile extension to Lumberport.

**Kanawha Traction & Electric Company, Parkersburg, W. Va.**—The Public Utilities Commission of Ohio has granted the Kanawha Traction & Electric Company permission to issue \$1,700,000 of 5 per cent bonds, \$40,000 of which is to be used in improvements in the property in Parkersburg and \$33,000 for the construction of a reinforced concrete viaduct at Boaz.

**Norfolk & Western Railway, Roanoke, Va.**—Extensive improvements, involving an expenditure of between two and three million dollars, will be made by the Norfolk & Western Railway within the next few months. Among the improvements planned is the extension of the electrification of its system on three divisions.

**West Virginia Traction & Electric Company, Wheeling, W. Va.**—Work will soon be begun by the West Virginia Traction & Electric Company laying new rails at various points along its line. New track will be laid at Fulton and Woodsdale Streets and at the curve at Echo Point.

#### SHOPS AND BUILDINGS

**Pacific Electric Railway, Los Angeles, Cal.**—It is reported that this company will construct a depot at the corner of North Lemon and West Maple Streets, Orange.

**Interborough Rapid Transit Company, New York, N. Y.**—Bids will be received by George H. Pegram, chief engineer, 165 Broadway, for the completion of the passenger station electric lighting and electric heating systems for Routes 36 and 37, Borough of Queens, and the Jerome Avenue and White Plains Road lines in the Borough of the Bronx, Routes 16 and 18.

**New York Municipal Railway, Brooklyn, N. Y.**—Bids will be received by the Public Service Commission for the First District of New York until Oct. 19 for the construction of concrete track floors and platforms over the mezzanines of eleven stations on the Culver line.

**Cleveland, Alliance & Mahoning Valley Railroad, Alliance, Ohio.**—It is reported that this company will construct a carhouse and repair shops at the junction of the Alliance and Warren divisions in Ravenna.

**Oshawa (Ont.) Railway.**—A report from the Oshawa Railway states that during the next few weeks contracts will be placed for the construction of a heating chamber and for the installation of a complete steam-heating system in the carhouse and workshops at Oshawa.

**Toronto (Ont.) Civic Railway.**—A nine-car addition is being built to the carhouse of the Toronto Civic Railway at St. Clair Avenue, Chalkley & Sons, Toronto, being the contractors.

**Monongahela Valley Traction Company, Fairmont, W. Va.**—This company reports that it expects to place contracts within the next three weeks for the construction of a small storage barn at Gypsy, W. Va.

**Norfolk & Western Railway, Roanoke, Va.**—Among the improvements being planned by the Norfolk & Western Railway is the construction of a new freight station and additions to its shops in Roanoke.

#### POWER HOUSES AND SUBSTATIONS

**Trinidad Electric Transmission, Railway & Gas Company, Trinidad, Col.**—Extensions are being made to the plant of the Trinidad Electric Transmission, Railway & Gas Company, including the installation of a 5000-kw. turbine. Haller & Krumbhaar, 68 William Street, New York, consulting engineers.

**Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa.**—This company will construct a substation at Brushy, Iowa.

**Morris County Traction Company, Morristown, N. J.**—A report from the Morris County Traction Company states that a new substation is being built at Dover, N. J. The company has just received a 500-kw. rotary converter outfit from the General Electric Company.

**International Railway, Buffalo, N. Y.**—Plans are being made by the International Railway to construct a substation at Twenty-fourth Street and Allen Avenue, Niagara Falls.

## Manufactures and Supplies

### TENDENCY STRONG FOR MOTOR-SIZE STANDARDIZATION

#### Myles B. Lambert Urges Adoption of a Few Standard Motors—Operating Officials Aid Motor Develop- ment—Circuit Breakers vs. Fuses on Cars

Standardization of railway motors is nearer than ever before, and railway men and motor designers are showing a stronger and stronger tendency toward this goal. These statements and those that are reported in the following interview were recently made by Myles B. Lambert, of the Westinghouse Electric & Manufacturing Company, to a representative of this paper.

Mr. Lambert said that the need for motor standardization is recognized on the score of service efficiency and economy.

Until recently, however, the electric roads as a class have not seemed to have a full understanding of just what the standardization of their motors would mean. There are now, including foreign and locomotive motors, approximately seventy-five types and sizes which the manufacturers are called upon to build. This is a greater variety than is necessary. All service requirements could be met by six types, within the range of 25 to 100 hp. Notwithstanding the multiplicity of designs and sizes available, the manufacturers are regularly confronted with demands for detail changes in motors that have excellent road records and for the inclusion in the design of what might be characterized as fads. The interpole railway motor has been on the market about ten years, and it is significant that during this time there have been only one or two motor designs that may be said to have remained standard for a reasonable length of time.

In earlier days the Westinghouse 101-B and the General Electric 80 motors were accepted very largely as standard motors. After their acceptance the engineering departments of the manufacturers, not being required to continue the redesign of these motors, could afford to devote a proportionately greater amount of engineering study and refinement to the two types mentioned. This benefited the purchaser as well as the manufacturer. One of the developments of this particular work was the spring cushioning of field coils. Purchasers of railway motors call for so many capacities, presumably to meet various local conditions, that the manufacturer cannot devote the same amount of engineering study toward the final refinement of any one type of motor as would be given to development work if there were fewer sizes of motors to be manufactured. For these reasons, as well as for reasons of economy in manufacture and sale, it is urged that the roads adopt a smaller number of types of motors within a given range of horsepower.

Undoubtedly a great deal of the credit for the development of the railway motor to its present high state is due to the co-operation rendered by railway officials. For service data and for authoritative opinions on the value of changes in design, the manufacturers put great reliance on the observations of the operating engineers. For that reason, as well as for the good of the industry, the manufacturers are desirous that the roads maintain the personnel of their mechanical staffs at the highest possible point. Operating men of high mechanical ability probably do as much to develop the technical side of railroading as the men in all other departments of a road. Only by the co-operation between the manufacturers and the mechanical officials has it been possible for the electric railway motor to reach its present highly developed state, and to be able to render the remarkable service that is reported for the newer types of equipment.

Reverting to standard motors, it is quite clear that if there were fewer types to be manufactured more time could be devoted by both the manufacturer's development department and by the operating officials to the improve-

ment of details of each standard motor based on service tests. It is true that with such a great multiplicity of motor designs, all of which stand up very well for a number of years, no great amount of time is available for thoroughly studying each principle and for improving any one type, because at the end of the normal life of a motor a new type is called for.

The motor of to-day for any given rating is called upon to do its work under more severe operating conditions than ever before. Cars accelerate faster because there is less voltage drop in the distribution system. Consider, for instance, the power distribution networks of to-day as compared with those of ten or fifteen years ago. Now, the trolley wire in the large cities is supplemented by an enormous amount of copper, fed from rotaries of great capacity. The track rails are welded or heavily bonded and even supplemented with continuous return copper. Thus the drop in the voltage due to the load, even though the load may be caused by a blockade, is relatively small, and the motor of a given capacity operating on a city system thus equipped performs a proportionately higher duty than the same motor in earlier days or than it does even to-day on smaller roads with their lighter distribution circuits. Higher mechanical strains and electrical stresses also must be met.

These conditions and the general appreciation of a motor built to require little maintenance expense have brought into quite general favor the solid-frame, box-type motor. In heavy city service the split-frame motor will not make the same record for low maintenance cost as the box-type motor. The split frame, where subjected to the stresses of heavy service, is less rigid and in consequence demands earlier attention for maintenance of such parts as loose housings and bearings, worn-out brush-holders, loose bolts, etc.

Standard multiple-unit control equipment is fairly well established. New types were recently developed to accommodate all types of cars, including the low-floor design. The multiple-unit type is rapidly becoming popular for city service, even where single cars are used. Among the large companies using this type are the Boston Elevated (surface lines), New York Railways, Third Avenue Railway, Brooklyn Rapid Transit, Public Service Railway, Toledo Railway, Mahoning & Shenango Valley Railway, Scranton Railways, United Railways of Baltimore, Pittsburgh Railways, United Railroads of San Francisco, and many other smaller properties.

There is, however, a great opportunity for economy in standardizing methods of installation and car wiring. The average car builder and railway operating engineers are in doubt as to how much to charge or estimate for installation of equipment. A car builder, in order to be safe in his estimate, must add a contingent allowance, because hardly any orders of control are installed in accordance with the plans followed on any previous job.

There is an opportunity here for the equipment committee of the American Electric Railway Engineering Association to establish standard methods of installation showing desired clearances, sizes and arrangement of conduit and car wiring, which are now lacking, and which the control manufacturers and car builders would all understand and work toward.

Speaking of circuit-breakers, Mr. Lambert said that the car circuit-breaker has become merely a canopy switch on those large city systems which have enormously heavy feeder and return circuits. When there is a short in the motor an enormous amperage is drawn from the heavily fed line, and it is almost without the possibility of commercial manufacture to build circuit-breakers that will safely and repeatedly handle such disturbances, particularly so since the circuit-breaker is mounted in the vestibule. Several years ago Mr. Olds, then superintendent of equipment for the Milwaukee Electric Railway & Light Company, fused each motor and urged the more general adoption of his practice. Mr. Lambert thinks that this safety method will later become general practice, namely, the use of a fuse on every motor in addition to a circuit-breaker or a high-capacity limit switch.

Because of the abnormal conditions existing in the raw materials field, engineers have found it necessary to substitute certain equipment parts so that available materials

could be used in place of those on which the supply is extremely restricted. For example, the asbestos market is glutted, and it is practically out of the question to secure the necessary quantity of asbestos heretofore used in railway equipment construction. Therefore, the manufacturers have employed treated cloth wherever possible. During the summer it was almost impossible to obtain tin, and the Westinghouse development department perfected a very high-grade lead base alloy. This bearing metal has demonstrated itself, it is said, to be the equal of the tin base alloy, and it may be adopted generally later, a plan which would reduce maintenance cost.

The Westinghouse Electric & Mfg. Company's plant at East Pittsburgh is busier than ever before. There are now more than 29,000 people on its payroll, which amounts to nearly \$2,000,000 a month. A very small part of this organization is employed in munitions manufacture. That work has practically all been removed from the East Pittsburgh plant of the Electric Company to other buildings especially devoted to munitions manufacture. Prices on railway equipment and supplies now seem to be at a maximum, and there has been no basic increase since the 1st of August. Deliveries on railway motors are quoted at from six to eight months, based on copper delivery.

### ROLLING STOCK

Levis County Railway, Levis, Quebec, is constructing two 32-ft. single-truck cars in its own shops.

Louisville (Ky.) Railway is contemplating the purchase of three trail, baggage and freight cars, 40 ft. over-all.

Blue Ridge Light & Power Company, Staunton, Va., is contemplating the purchase of six light-weight one-man cars.

Montgomery Light & Traction Company, Montgomery, Ala., has purchased five 21 E trucks from The J. G. Brill Company.

Grand Rapids (Mich.) Railway will purchase about Feb. 1, 1917, fifteen single-truck, double-entrance, pay-as-you-enter motor cars about 45 ft. over-all.

United Railways & Electric Company, Baltimore, Md., has issued invitations for tenders covering the furnishing of seventy-five double-truck, semi-convertible, four-motor, pay-within cars, together with all appurtenances. Bids are to be submitted not later than noon, Oct. 16.

Corning & Painted Post Street Railway, Corning, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 12 as having ordered four cars from the Southern Car Company, has received this equipment. These cars are arranged for double end operation either as one or two-man cars and are mounted on Philadelphia Holding Company's radial axle trucks with 11 ft. 6 in. wheelbase and are equipped with G E 258-B motors.

### TRADE NOTES

Ohio Brass Company, Mansfield, Ohio, has received from the Connecticut Company a large order for overhead material, consisting of trolley frogs, trolley ears, crossovers and section insulators.

Western Electric Company, New York, N. Y., announces the removal of its offices and show rooms in Buffalo from 98 Terrace to 709-711 Main Street, where two large show windows afford splendid display facilities. J. W. Tabb is the manager.

Charles Lounsbury has been elected president and general manager of the American Railway Supply Company to take the place of the late Walter Chur, who died on Aug. 29. Mr. Lounsbury has been with this company for thirty years and was formerly assistant to Mr. Chur.

Robert C. Clifford, who for the past four years has been district sales manager of the U. S. Cast Iron Pipe & Foundry Company, in charge of their St. Louis and Kansas City offices, is now associated with the Walter A. Zelnicker Supply Company, St. Louis, Mo., in charge of its rail department.

McKeen Motor Car Company, Omaha, Neb., is shipping a 55-ft. 200-hp. composite McKeen motor-car to the Lakeside & Marblehead Railroad. The car makes the trip under its

own power in charge of a demonstrator from the works. It is to operate on the 8-mile line between Danbury and Marblehead in Ohio.

G. L. Simonds & Company, Chicago, Ill., announce a change in name. In the future the company will be known as the Vulcan Fuel Economy Company. The personnel and policies of the organization remain the same. The only change, in addition to that of the name, is an increase in capital, the better to handle the company's growing business.

Holden & White, Chicago, Ill., have been appointed general sales distributors by the Safety Appliance Company of Chicago, manufacturers of locomotive and electric railway car sanders and sanding devices. This will mean the introduction to the electric railway field of the Reliance air sander, which provides for positive delivery of sand to the rails.

Edgewater Steel Company, Pittsburgh, Pa., which was recently incorporated, has completed the details of organization and has purchased the plant of the Kennedy-Stroh Corporation at Oakmont, Pa. In addition to carrying on the lines of manufacture in steel and brass formerly handled at this plant, new construction is now under way to give this company a well-equipped plant for the manufacture of locomotive and car-wheel tires, rolled-steel wheels, gear rims, roll shells and turbine rings.

Lindsley Brothers Company has removed its general sales offices from Minneapolis to 832-34 Edison Building, 72 West Adams Street, Chicago, Ill. District sales offices will be continued both in Minneapolis and St. Louis. Headquarters will continue at Spokane, Wash., as in the past. To further improve its service to pole users the general sales offices in Chicago have been divided so that an expert will be in charge of each line of the business. G. L. Lindsley will be available at all times for consulting service, R. L. Bayne, for many years in charge of the service department, will devote his entire time to seeing that all requirements are properly taken care of, and H. S. Sines will devote his time to assisting customers in selecting the proper materials.

The Ackley Companies, represented by G. S. Ackley & Company, 50 Church Street, New York, N. Y., report a very satisfactory increase in export orders for material handled exclusively through the New York company and through various agencies. Among orders recently received for Ackley adjustable and No-staff brakes are a number from South Africa, Japan, Australia, New Zealand, Cuba, Russia, England, Chile, Brazil and Argentina. Many orders for Tool Steel gears and pinions have been received for use in mine tram cars and other industrial plants for Norway, Sweden, Holland, Russia, France, Italy, Greece, South Africa, Australia, New Zealand and Cuba. Orders for Wasson air-retrieving trolley bases have been received from Peru and Australia. They also report a very satisfactory domestic business on the Automatic trolley guard and on renewable fuses.

### ADVERTISING LITERATURE

American Steel & Wire Company, Chicago, Ill., has issued a manual of its process of water purification with sulphate of iron.

Universal Safety Tread Company, Boston, Mass., has issued an illustrated circular on Universal safety tread for school work.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued the bulletin No. 207, giving a partial list of the material it has on hand.

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued an illustrated circular, printed in two colors, describing the Drew protective and reclaiming pole sleeve.

Darborn Chemical Company, Chicago, Ill., has just issued a booklet entitled "Incrustation, Corrosion, Foaming and Other Effects of Water Used in Steam Making and Methods of Prevention." The booklet is divided into three chapters, chapter 1 describing corrosion and its causes; chapter 2, incrustation; and chapter 3, foaming. A detailed description of the service rendered by this company is also given.